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Eighty-Third Annual Meeting

HOUSTON, TEXAS

OCTOBER 27 to 31

A New Century of Dental Progress Begins

OCTOBER 1941

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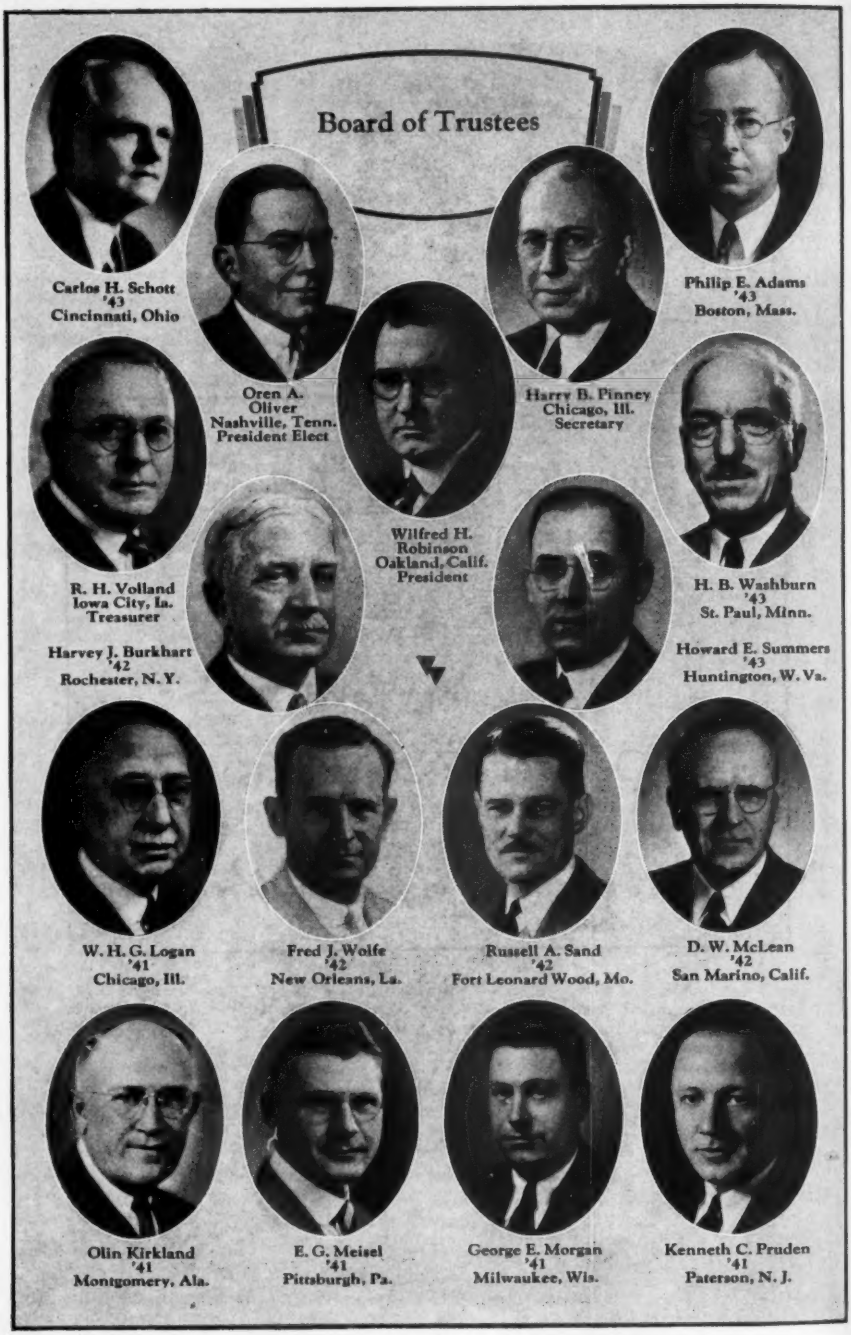

BOARD OF TRUSTEES, AMERICAN DENTAL ASSOCIATION, 1940-1941

THE JOURNAL
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Vol. 28 OCTOBER 1941 No. 10

CHANGES IN THE MANDIBLE FOLLOWING CLOSURE OF THE BITE WITH PARTICULAR REFERENCE TO EDENTULOUS PATIENTS

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New York, N. Y.

FORM AND FUNCTION OF BONE

CAREFULLY planned experiments, as well as clinical cases, some of which have been transformed into experiments through surgical interference, have proved that the form of movable bones is dependent to a considerable degree on their function or lack of function.[1]

The calcaneus is an interesting example of a bone which has been subjected to critical analysis. Weidenreich[2] concluded that the development of the form and architectural pattern of the normal adult bone is dependent on conditions imposed by normal posture and mode of locomotion.

Many examples of the effect of function on the form of long bones are recorded in the literature. Asymmetric development following recovery from infantile paralysis, when more extensive damage was done on one side than on the other, is a familiar example.

The congenital absence of a muscle or a group of muscles may have a similar result. The following case was reported by Lesshaft.[3] In a girl 11 years of age, the sternocostal part of the pectoralis major muscle was absent on the left side and normal on the right. The left arm was shorter and weaker than the right. In the belief that the skeletal defect was due to greatly diminished function, exercises were instituted. After four years of this therapy, the defective limb became equal to the normal one in every respect.

Ankylosis from injury or disease in early childhood also results in striking defects. In these cases, the joints involved are completely immobilized. Figure 1 illustrates a case of Henry Sage Dunning, a marked deformity of the mandible in a boy aged 17. An injury at the age of 4 resulted in a bilateral bony ankylosis

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of the temporomandibular articulation, destroying the joint, preventing all motion of the mandible and hindering its development. There is practically no effect on any other facial bone. We would expect this since other facial bones lack motion. It is always the movable bones whose form is most altered by changes in function.

There is undeniable evidence that adult bone may likewise undergo modification following changes in the stresses and strains to which it is subjected. We are all familiar with the classical papers on this subject by Roux,[4] Wolff,[5] Koch,[6]

Fig. 1.—Case of bilateral ankylosis of the temporomandibular articulation in 17-year-old boy; showing lack of development of mandible. (Courtesy Henry Sage Dunning.)

Jansen,[7] Carey[8] and others. Ankylosis of the adult knee joint is followed by drastic changes in the skeleton of the lower extremity. Examples of this type are relatively rare when compared with local changes in alveolar bone following loss of the teeth. So frequent are these in the mandible and the maxillae that these bones are described as the only adult bones which normally alter their gross form in old age. This is brought about by resorption of the alveolar process following the loss of teeth. These changes are the *raison d'etre* of prosthetic dentistry.

MODIFICATION OF ALVEOLAR BONE

A few illustrations will serve as a review of certain familiar facts. If we examine a normal skull having a full complement of teeth (Fig. 2), we will

Fig. 2.—"Normal" skull having a full complement of teeth.

Fig. 3.—Edentulous skull. The patient never wore dentures. The knifelike alveolar ridges are to be noted. (Courtesy Clay-Adams Co.)

note the height of the alveolar process, the position of the mental foramen and the marked development of the ramus is the most obvious difference. In Figure 4, a different view of the same skull, resorption of the alveolar process has

Fig. 4.—View of skull shown in Figure 3. F, break in wall of maxillary sinus.

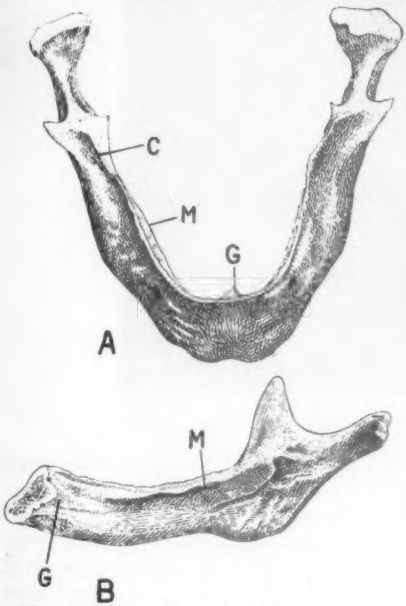

Fig. 5.—A, mandible of skull shown in Figure 3, viewed from above. B, medial surface of same mandible.

of the mandible. In a comparison of this picture with that of an edentulous skull (Fig. 3), resorption of the alveolar bone

Fig. 6.—"Normal" mandible placed on protractor to record angle (110 degrees).

been greater on the inferior and buccal surfaces and less on the lingual surface. Thus, not only has the vertical dimension of the alveolar ridge decreased, but also the crest of the ridge has shifted lingually.

In the mandible, the most extensive resorption of alveolar bone occurs on the superior surface of the ridge and on the lingual surface of at least the posterior part of the ridge. Thus, the crest of at least the posterior portion of the mandibular ridge becomes wider than the cor-

responding part of the maxillary crest, which causes the overlap on closure. The accidental breaks in the wall of each maxillary sinus of Figure 4 at F were caused by the posterior part of the mandibular crest striking the body of the maxillae on complete closure. These fractures are landmarks indicating the difference in width of the upper and lower alveolar ridge crests. Kingery[9] suggested careful arrangement of the teeth to meet the demands imposed by the progressive changes in the interalveolar crest angle of edentulous patients.

When all of the teeth are extracted at about the same time, the ridges are more or less uniform in their curvature. When a maxillary molar has been left on each side as an abutment for a partial denture, the buccal plate presents a local prominence. After the extraction of this tooth, if the condition is present bilaterally, the remaining part of the buccal plate adds another problem to the construction of a full denture and usually indicates surgical measures, as Kingery[9] pointed out.

In some patients who have worn full lower dentures for a long time, almost all of the alveolar bone has disappeared. Anteriorly, near the midline on the lingual surface, the ridge has reached the level of the genial tubercle for the attachment of the genioglossus muscle (Fig. 5, G). Posteriorly, it was worn down to the mylohyoid line (M), which now becomes accentuated to form a crest. On the buccal surface in the bicuspid and molar regions, the resorbing alveolar surface encroaches on the attachment of the buccinator without producing a sharp margin (at B). In the postmolar region, a sharp crest (Fig. 5 at C) frequently appears at the mandibular attachment of the superior constrictor and the pterygomandibular raphe. The essays of Pendleton[10] and of MacMillan[11] and others

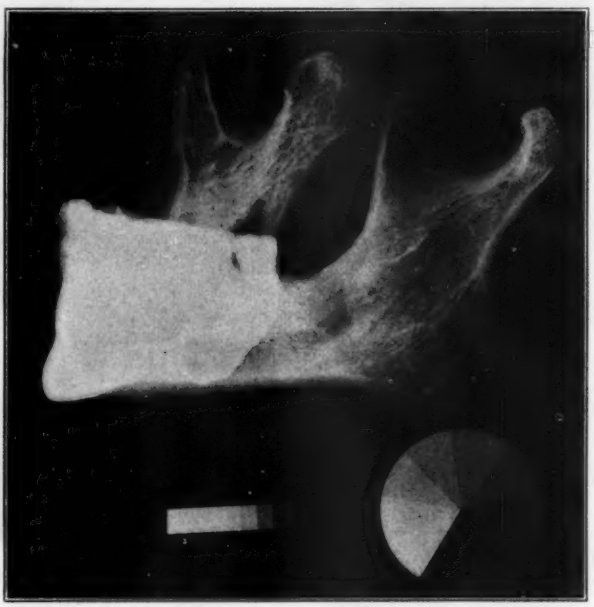

Fig. 7.—Mandible seen in Figure 6; penetrometers inserted to give density scale.

give an excellent idea of these structures and their significance in full denture prosthesis. These changes, which one must cope with in practice, are structural responses to changed functional demands.

With the thinning of the hard palate and resorption of the apical projections into the maxillary sinus, the story of the maxilla is fairly complete; but, in the case of the mandible, only those alterations associated with the alveolar bone are well known.[11] In fact, one observer, Hellman,[13] denies any functional remodeling of the mandible, exclusive of the alveolar region, once it has attained its maximal development. However, Breitner[15, 16] has shown functional remodeling of the monkey mandible during experimental changes of mesiodistal relations of the jaws.

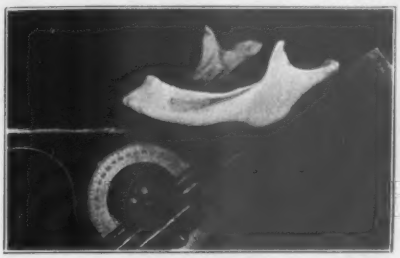

Fig. 8.—Edentulous mandible placed on protractor to record angle (142 degrees).

Fig. 10.—Edentulous mandible placed on protractor to record angle (128 degrees).

Fig. 9.—Mandible seen in Figure 8.

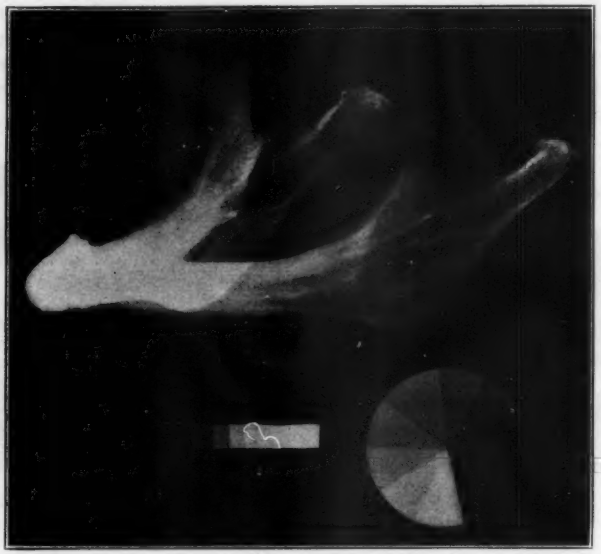

Fig. 11.—Mandible seen in Figure 10.

Fig. 12.—Skull of old person. Only a lower cuspid and an upper bicuspid are present. The rest of the dentition had broken down through caries, only roots remaining. There is closure of the bite, with a change in the angle of the mandible (143 degrees). (Courtesy Clay-Adams Co.)

MODIFICATIONS OF THE RAMUS AND THE ANGLE

It is recorded in textbooks of anatomy that the angle of the adult mandible is about 110 to 120 degrees at its peak of development, and that, in old age, after the teeth are lost, the angle opens out to about 140 degrees and the condyle is "bent back" so that the mandibular notch is widened. Burtenshaw[17] and Stein[21] recently voiced the opinion of many that the flattening of the angle of the man-

dible is due to the "continued action" of the masseter muscle. Only one author, Tomes,[18] associated the changes of old age with a decrease in muscular power. This, to the best of our knowledge, is the sole attempt to explain the cause of these changes in terms of lost function.

From our collection of 300 mandibles with different conditions of dentition, we have selected a series that shows a progressive cycle of changes in the angle, the ramus, the coronoid, the condyle and the notch of the mandible. We believe that careful study of this material gives an insight into the mechanism respon-

Fig. 13.—Mandible illustrating conditions resulting from neglect. The protractor records an angle of 156 degrees.

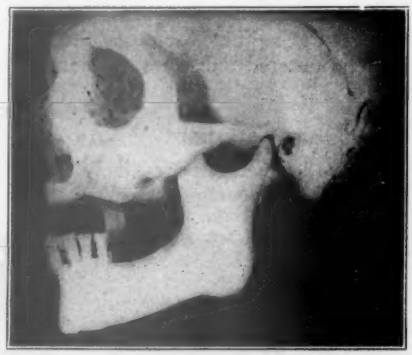

Fig. 15.—Skull of man who had worn full upper and partial lower denture for a period of years. The "normal" angle of the mandible is due to maintenance of function.

Fig. 14.—Mandible seen in Figure 13; showing loss of density of bone in region of ramus, particularly in coronoid process and adjacent part of notch. Little spongy bone remains at the angle. (Compare Figure 7.)

sible for the changes. What is even more interesting is the realization that prosthetic dentistry can minimize these regressive processes so frequently spoken of as characteristic of old age; for these changes are neither limited to the aged nor encountered only in edentulous patients.

METHODS

Each specimen was routinely photographed and roentgenographed under comparable conditions. In taking the photographs, the body of the mandible was placed on the horizontal plane of the table and the radial arm of a protractor adjusted on the graduated scale of the arc, to correspond with the angle which the ramus makes with the body of the mandible. Other views were also taken.

The roentgenograms were taken by Dean Houghton Holliday under uniform conditions: distance from target to film, 30.5 inches; exposure, 8 seconds at 15 milliamperes; 50 kilovolts. A circular aluminum penetrometer, with ten sectors increasing progressively from 1 to 10 mm. in thickness, was placed beside each mandible as a scale of density. A tin penetrometer with eight graded steps was also used. By the use of these penetrometers, one can compare the density of the same parts of different bones.

Fig. 16.—Mandible similar to that in Figure 15. The normal density and trabecular pattern of the angle and ramus are to be noted.

DESCRIPTION OF CASES

The angles of twenty normal mandibles having a full complement of teeth or only one tooth missing were measured. The range for the angle was between 107 and 126 degrees.

Figure 6 is typical of this group, a heavy set mandible minus the third molar on the left side. The angle is 110

degrees, with the protractor overlapping the condyle. There is marked occlusal wear of all teeth with obliteration of cusps. Even the incisors are deeply worn. There was also a harmonious rate of tooth eruption compensating for the attrition of all of the teeth.

Figure 7, a roentgenogram of this mandible, shows the great density of the cortical plates and the classical architecture of the trabeculae, which are adapted for resisting stresses of pressure and tension. The alveolar bone around the roots of the molars is well developed. The density of the mandible can be judged by the gray scale of the penetrometers.

Figure 8 is the mandible of the skull

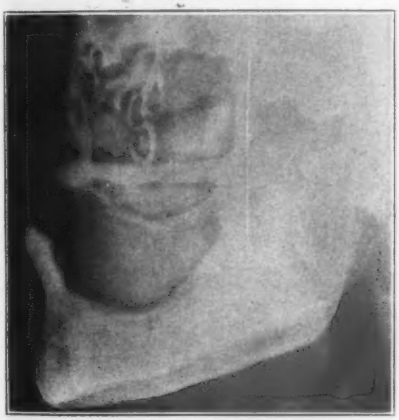

Fig. 17.—Clinical roentgenogram of patient aged 68, taken without dentures.

shown in Figures 3, 4 and 5. This edentulous mandible has knifelike alveolar ridges. The angle is 142 degrees. There was marked closure of the bite, which resulted in a decrease in intermaxillary distance and also in the distance between the origin and insertion of the masseter, temporalis, internal and external pterygoid muscles. Loss of tension of these muscles followed. This loss is most easily observed and detected by palpation in old edentulous patients who have not worn dentures and in all other edentulous patients when the dentures are removed. Reference has frequently been made to the loss of tone in the masseter, the only one of these muscles which can be observed throughout its entire extent owing to its superficial position. The regions which have changed are those into which the above-mentioned muscles are inserted.

A roentgenogram of this mandible is shown in Figure 9. The changes discussed above as well as the density of the bone are well illustrated. The spongiosa in the region of the angle is reduced in quantity, but the architectural pattern of the remainder is retained. (Compare Figure 7.)

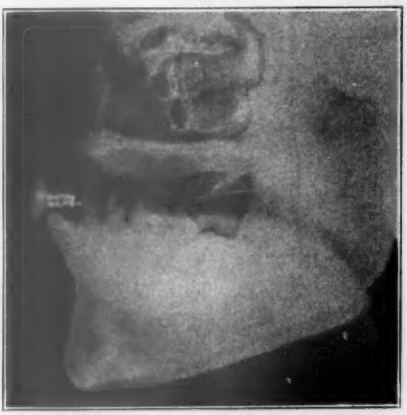

Fig. 18.—Clinical roentgenogram of case shown in Figure 17, with full upper and partial lower dentures in position. The relatively normal angle of the mandible is due to maintenance of function.

Figure 10 is a photograph of another edentulous mandible. Virtually no alveolar bone remains. Resorption has reached the level of the mylohyoid ridge, forming a sharp crest at M. Anteriorly, in the midline, the superior surface of the alveolar bone is at the level of the genial tubercle (G). In the bicuspid region, the mental foramen (F) opens on the superior buccal surface. To judge from the rounded ridges, the denture worn by this

patient functioned well. The well-preserved ramus and the good angle (128 degrees) indicate that the tension on the muscles of mastication is maintained by "functional" dentures. We believe that the marked difference between this mandible and the one shown in Figure 8 is due to the wearing of a denture.

Figure 11 is a roentgenogram of the specimen shown in Figure 10. The general form of the angle, condyle and coronoid and the amount of spongy bone are not very different from the normal. The architectural pattern is unchanged. The position of the inferior alveolar foramen and canal and the mental foramen are easily seen in both of these figures.

Figure 12 is a long narrow skull of an old person. Only a lower cuspid and an upper bicuspid are present. The rest of the dentition is broken down from caries, only roots remaining. This is a classic example of neglect. Closure of the bite over a period of years is associated with modifications of the angle, ramus, condyle, coronoid and mandibular notch. The angle is 143 degrees.

Figure 13 is a photograph of a similar case of neglect, resulting in closure of the bite which, we believe, starts the cycle of changes resulting in atrophy of the posterior part of the mandible.

Although some of the teeth and surrounding alveolar bone are still present in these last two cases, there is nevertheless a tremendous widening of the angle, the first being 143 degrees and the second 156 degrees.

Figure 14 is a roentgenogram of the mandible shown in Figure 13. Not only have marked changes occurred in the sagittal plane of the ramus, but also the decrease in the mediolateral dimension is so marked that the compact cortical

Fig. 19.—Two positive prints of clinical roentgenograms of same patient, illustrating differences in facial contour and vertical height. Left: Positive of Figure 18. Right: Positive of Figure 17, printed to show soft tissue detail.

plates have encroached on the spongy bone, reducing it to a minimum. Nevertheless, that remnant of the spongiosa has essentially the same trabecular arrangement as it formerly had. The roentgenogram illustrates well the great change in the shape of the head and neck of the condyle, due to resorption along its anterior surface. We consider that there is probably some correlation between this modification of the condyle and the loss of powerful lateral grinding motions. Patients of this type, having only the lower anterior teeth remaining for a period of years, from necessity become "nibblers," as pointed out by Kingery.[9]

Figure 15 is a photograph of the skull of a man who had worn a full upper

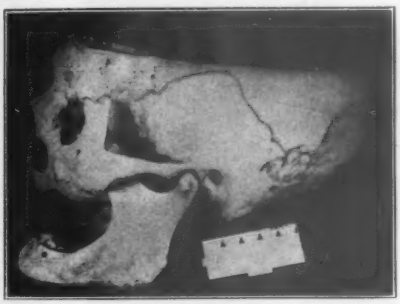

Fig. 20.—Case illustrating importance of maintaining proper intermaxillary distance. No changes occurred in the angle and ramus of this mandible owing to the use of dentures.

denture over a period of years to judge from the condition of the maxillary ridges, which have almost reached the level of the palate. The maxillary and palatine bones are quite thin.

In the mandible, only the anterior teeth remain. They are all "stop teeth," well worn, and this attrition was compensated for by continued eruption. The bite was opened to normal and tension restored through full upper and partial lower dentures. There are no changes in the angle and ramus of this mandible.

Figure 16 is a roentgenogram of a similar mandible. The anterior teeth alone remained and the missing posterior teeth were replaced by a partial denture. The angle, ramus, coronoid, condyle and notch are normal. The density of the bone and the architectural pattern of the trabeculae compare favorably with those of the normal mandible, shown in Figure 7. The region of the ramus, below the dorsal third of the inferior alveolar canal, is well preserved.

Figures 17, 18 and 19 are clinical roentgenograms of the same patient, aged 68, who has worn a full upper denture for ten years. Several years ago, it had to be replaced. A partial lower denture was worn for fourteen years. It was remade a few months ago. Both the full upper and the partial lower functioned and are now functioning well.

Figure 17 shows the patient without dentures. The shape of the alveolar ridges is evident. The outline of the ramus and angle of the mandible indicates only a moderate alteration from the normal picture.

Figure 18 shows the case with the dentures in place. The radiolucent base (vernonite) of the upper gives a good picture of the placing of the teeth with respect to the ridges. The vulcanite base of the lower partial is radiopaque and consequently blocks out all other shadows in its vicinity.

Figure 19 shows two positive prints of clinical roentgenograms of the abovementioned patient illustrating the differences in facial contour and vertical height, with and without dentures. Other features are also indicated by the shadows of the soft tissues.

DISCUSSION AND SUMMARY

The problem of establishing the correct vertical height has always been an important one in full denture service. Boos'[19] recent method (1940), using biting power as an index for establishing proper intermaxillary relations, is most significant. In edentulous patients having a closed bite, the maximum vertical

power was obtained in a more open relation than was afforded by the denture occlusion. Edentulous patients wearing extremely "closed" dentures had less biting power than those patients whose dentures were nearer the normal vertical height.

wise a reduction in biting power and a certain degree of atrophy from lack of proper function following loss of teeth.

Our material indicates a mutual relation between form and function in the mandible. In particular, we suggest that a causal relation exists between changes

Fig. 21.—Different views of skull of individual whose remaining teeth act as "stop" teeth. The attrition of these teeth is evident. Correct vertical height was maintained by continued erupton of these teeth. The normal angle and ramus of the mandible are to be noted.

Boos' findings fit perfectly with our observations. Sagging muscles cause not only marked facial deformity, but like-

in the angle and ramus of the mandible and a decrease in tension of the muscles of mastication, following closure of the

bite. Resorption of the bone occurs in the region into which these sagging muscles are inserted.

Widening of the angle is caused by resorption in the region of the angle and adjacent parts of the ramus and the body. The posterior border of the ramus, below the condyle, tends to converge toward the anterior border instead of remaining more or less parallel to it, as is the case at the peak of development. (Compare Figure 6 with Figure 8.) Widening of the angle is associated with decrease in tension of the "sling" formed by the masseter and the internal pterygoid muscles.

Resorption on the anterior surface of the condyle, especially marked in the pterygoid fossa at the insertion of the external pterygoid, widens the mandibular notch and, with the aid of the altered dorsal border of the ramus, causes the condyle to appear as if it were "bent backward." (Figs. 13 and 14.)

A decrease occurs in the mediolateral and the anteroposterior dimensions of the coronoid process to which the temporalis muscle is attached. Resorption along the posterior border of the coronoid helps to widen the mandibular notch.

Figure 3 shows all of these changes in an edentulous patient who never wore artificial teeth. That this condition can be prevented is illustrated by A of Figure 20, showing a patient, edentulous for a long period of years to judge by the marked resorption of alveolar bone. This individual wore full dentures, which maintained the correct intermaxillary relations. The changes are limited to alveolar bone. Figure 15 is the skull of a person who wore a full upper and a partial lower denture for years. The proper vertical height was maintained. No changes occurred in the angle or ramus. A and B, Figure 21, are different views of the skull of a person whose anterior teeth alone remain as "stop" teeth. The attrition of these anterior teeth is evident. Correct vertical height was maintained by continued eruption of these teeth.

Gottlieb and Orban[20] showed that when there is harmony between active tooth eruption and the attrition of opposing incisal and occlusal areas of teeth, there is no closure of the bite. Diamond suggested that an interrelated balance among three conditions, the forces of mastication, the density of tooth structure and the force of continued eruption, is vital to normal function.

When there is no closure of the bite, there is no loss of muscle tension, little change in facial contour and no change in the angle or ramus of the mandible. Our material indicates that all of these changes occur with closure of the bite. Furthermore, it is evident that prosthetic dentistry can minimize these regressive processes, so frequently spoken of as characteristic of old age.

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CONSERVATIVE SILVER NITRATE TREATMENT OF BORDERLINE CASES OF DEEP DENTAL CARIES

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ALMOST a century has elapsed since silver nitrate was first reported in use by the dental profession. *(Der Zahnarzt,* 1846.) In 1854, Brooks referred to the value of this chemical in the treatment of erosion, and, in 1859, Taft mentioned its favorable effects. Clinical observations following treatment with silver nitrate were first reported by Stebbins (1891-a). Frank (1897), according to Miller, was the first to recommend the use of silver nitrate prophylactically, and Bryan pointed out its value in preventive dentistry. Before the twentieth century, silver nitrate was firmly entrenched in the profession as a remedy for hypersensitivity of dentin, erosion and pyorrhea and as a sterilizing agent and caries inhibitor in deciduous as well as permanent teeth. (Prinz, 1898; Holmes, Hunt, Parker, J. M. Howe, Hinman.)

Up to this time, silver nitrate was employed empirically in whatever concentration and by whatever method the particular author recommended. As a result, we find it used in powdered form, pressed into place by gutta-percha (Holmes, 1892); in powdered form, applied with wood points (Stebbins, 1891-b); in 50 per cent solution (Hinman); in saturated solution (Parker, Arrington); in pure crystal form (Prinz, 1905); by inserting a silver wire in nitric acid (Holmes, 1895); with a blotting pad saturated with silver nitrate (Pierce), later modified to an asbestos felt pad (Kirk). Szabo, in the first scientific investigation of silver nitrate solutions, clearly showed that the results were the same regardless of the concentration or method of use.

In 1905, Miller showed experimentally that silver nitrate would protect the dentin from decalcification and laid down the chemotherapeutic principles of its action. J. M. Howe (1900) sounded a

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warning note about the likelihood of pulp irritation following the use of silver nitrate and, in 1906, G. V. Black further cautioned the profession against the use of silver nitrate in deep cavities. In the same publication, it was pointed out that silver nitrate should be reduced by exposure to sunlight. Deck first called attention to the use of photographic developer as an agent for reducing silver nitrate. In 1917, Percy R. Howe introduced the ammoniacal solution and recommended a 25 per cent solution of formalin for reduction. Since then, numerous investigators (Roberts, Nesson, Booth, Richards, Carrington) have reported on silver nitrate medication for various purposes. Recently, Prime (1935) has taken up the cudgels for the use of ammoniacal silver nitrate as a disclosing agent in incipient dental caries.

Despite the many enthusiastic claims that have been made for ammoniacal silver nitrate as a sterilizing agent and caries inhibitor, a certain amount of antipathy has existed in the dental profession toward this medicament, because (1) the use of silver nitrate in deep cavities is often painful; (2) it discolors the tooth, and (3) there is danger of devitalization.

We believe that ammoniacal silver nitrate, when judiciously applied, can be the means of saving many doubtful teeth that are on the borderline between pulp conservation and pulp exposure; in other words, cases in which the pulps would most certainly be exposed if all carious material were excavated. These borderline cases were treated according to the procedure described below.

PROCEDURE IN BORDERLINE CASES

The ages of most of the patients were from 6 to 17 years. Only four patients were treated who were less than 6 years old and six who were over 17. (Table 1.) A total of 204 teeth were treated. Of this number, only twenty-one were deciduous. Although all types of teeth were treated, the majority of the remaining 183 teeth were first permanent molars, since these teeth were generally in the worst condition. All the teeth that were selected for treatment were badly broken down. (Fig. 1.)

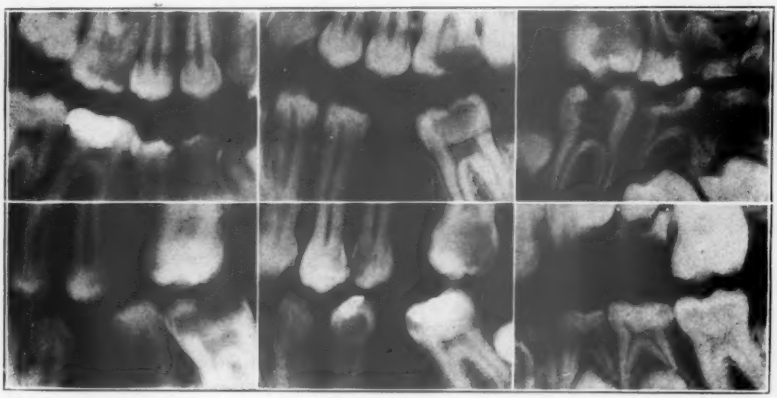

Fig. 1.—Types of cavities treated.

Before beginning treatment, the teeth were roentgenographed to determine whether the decay appeared to be at or in close proximity to the pulp; and, if the pulp did not seem to be endangered by the oncoming process of decay, the teeth were rejected for this type of treat-

ment. Many teeth gave a previous history of pulpitis or hyperemia. As already stated, every tooth was roentgenographed before treatment was begun and, if there was any doubt as to vitality, the teeth were tested with the electric pulp tester supplemented by heat and cold.

The treatment then generally resolved itself into the following routine. Whenever possible, the rubber dam was placed and the tooth dried. If there was a history of pulpitis or an existing ache, the extremely soft and superficially necrotic tissue was removed and a zinc oxide and eugenol dressing was placed in the tooth and left until the following visit. In the absence of pain, after removal of the superficially disorganized tissue, a pellet of cotton saturated with Howe's ammoniacal silver nitrate was placed in the cavity, being allowed to remain for several minutes. A pellet of cotton moistened with eugenol was then placed over this and sealed in the cavity with zinc oxide and eugenol. The rubber dam was then removed and a bitewing roentgenogram taken of the tooth. Too much decay must not be removed at this sitting or the application of silver nitrate may be attended with pain.

The patient was then dismissed for from three days to a week. At the second visit, the temporary dressing was removed and a little more carious tissue was excavated, but never to a point where the dentin was not stained black. This is important, since there is danger of needlessly exposing the pulp at this time by overzealous instrumentation and a desire to remove all traces of decay. The tooth was again treated with silver nitrate in the same manner as at the first visit and roentgenographed again. Roentgenographing the tooth after each treatment served a dual purpose: (1) it acted as a guide to show just how far the excavation had progressed, and (2) the white* "silver line" acted as a line of demarcation between organized and disorganized tissue. (Fig. 2.) As far as we have been able to ascertain, no mention of this "silver line" has been made previously in the literature. We believe that it is a valuable guide in treatment.

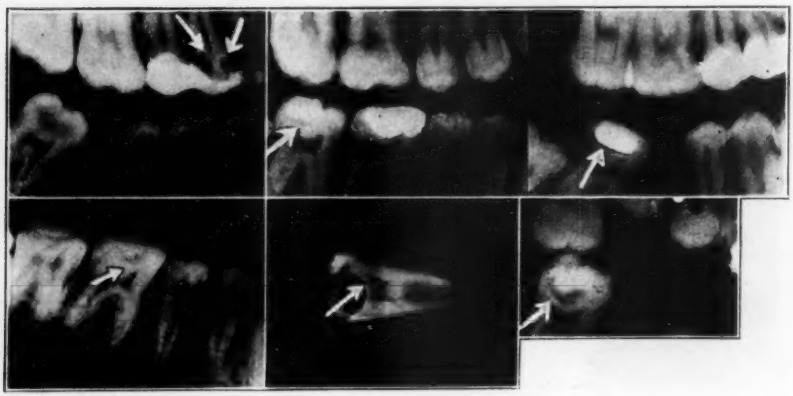

Fig. 2.—White "silver line" that appears in roentgenogram, following treatment with silver nitrate.

At the third visit, the same procedure was repeated. By this time (or even at the second treatment), the excavation was fairly close to the pulp, especially over the horns, and, with the aid of

*White refers to the appearance of this line in the roentgenogram as radiopaque.

the previous roentgenogram, it was now decided whether to go more deeply. In most cases, the operator decided to stop, apply silver nitrate again and fill, regardless of whether any carious tissue remained. One hundred and sixty-six cases of the 204 treated were filled at the end of three treatments. In twenty-eight other cases, it was decided to treat once more and, in ten other cases, five treatments were given. (Table 2.) In at least half of these cases, the removal of all carious material, even by careful instrumentation, would have resulted in pulp exposure. As a matter of fact, early in this series of cases, our overzealousness in removing all traces of decay led to the exposure of ten pulps—a mistake which was not repeated.

To learn whether silver nitrate had the power of devitalizing the teeth, it was decided to apply silver nitrate directly over the area of exposure in the ten teeth, above mentioned, and then to place a suitable pulp capping without removing any more decay present. In two cases in which the exposure was made at the first and second visits, large quantities of decay were left in the tooth. (Fig. 3.) The teeth were capped with either zinc oxide and eugenol or with thymol zinc oxide, and cement was placed over this and then amalgam.

RESULTS

The patients were instructed to report for check-up at six-month intervals. Unfortunately, only ninety-three of the original 204 patients returned. (Table 2.) Their teeth were roentgenographed again and tested for vitality. The longest period of time elapsing between the last treatment and the subsequent check-up was eighteen months; the shortest period, seven months. (Table 3.)

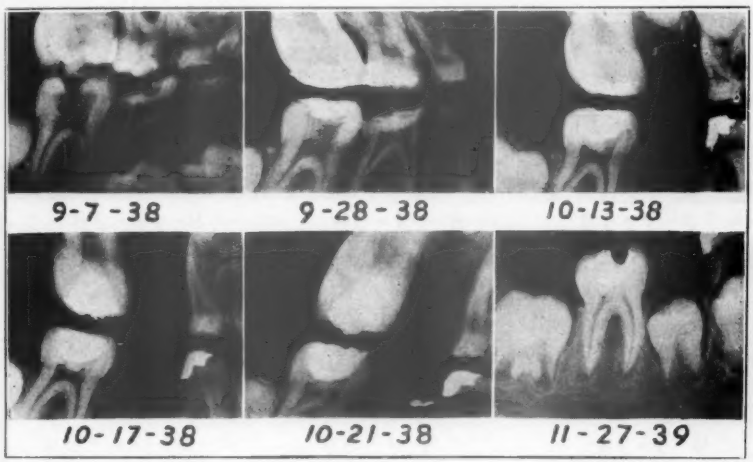

Fig. 3.—Four treatment case. The pulp of the lower left first molar was exposed October 13, 1938. It was treated with silver nitrate again October 17 and the pulp was capped. At the last checkup, November 27, the tooth was still vital. The calcification of the root ends on November 27, 1939 is to be compared with that present September 7, 1938.

Of the fifty-seven patients treated once, twenty-one returned for check-up. (See Table 3 for period of time.) All teeth were found to be vital and roentgenographically negative. Twenty-eight of the fifty-seven patients treated twice returned. All but one of the teeth gave a satisfactory response to the pulp tester. The one case that did not re-

spond was found to be roentgenographically negative and consequently was left in the mouth and marked as doubtful. Fifty-two teeth were originally treated three times before filling and twenty-six of the patients returned on recall. One of these teeth gave the patient trouble one month after it was filled and we decided to extract this tooth. Subsequent sectioning revealed a minute exposure which had been overlooked at the time of filling. One patient was found to have had the treated tooth extracted. We were told that the tooth had been uncomfortable and the parent had taken the child to a neighborhood dentist, who had extracted the tooth. The other twenty-four cases were vital and roentgenographically negative. In the four-treatment group, twenty-eight cases were completed, but only twelve patients returned for check-up. All were clinically sound and there were no areas of rarefaction in the roentgenograms.

Ten teeth were treated five times. As can be surmised, these presented the worst clinical pictures of all before the beginning of treatment. The majority of these cases presented a pulpitis, and bitewing pictures revealed no demarcation between the base of the cavity and the roof of the pulp chamber. Yet, only one of the ten cases was lost and we felt that it was lost needlessly. After the filling was inserted, the patient began to complain of paroxysmal attacks of pain. This occurred for several days before we saw the patient and, on the day that the patient came in, the parent insisted on extraction. We believed that the pain was due to trauma since the filling was high. Nevertheless, we consented to the extraction of the tooth, since all other permanent molars had already been extracted and a denture was being made.

Thus, of the ninety-three teeth checked on recall, only four were lost. There is every reason to believe that the percentage of success would be much higher if more cases could be checked, since pain of any sort would have

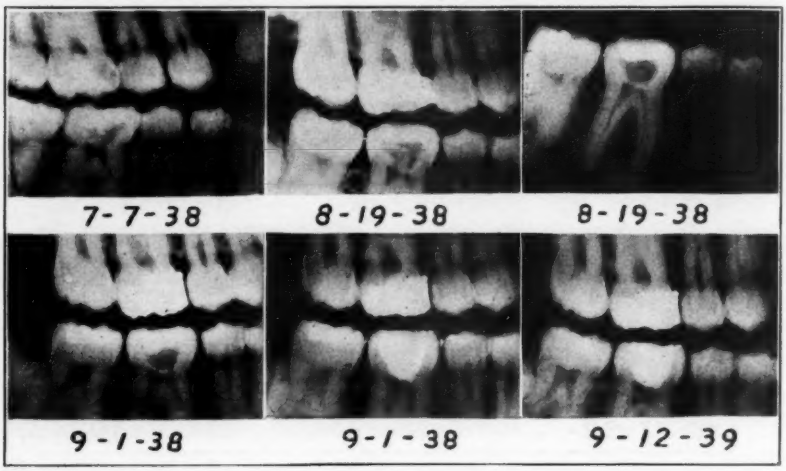

Fig. 4.—Upper left, original roentgenogram depicting caries under old amalgam filling. All the carious material was removed at the next visit (8/19/38) and the pulp was exposed. Silver nitrate was placed directly over the exposed pulp and the tooth was filled. It has been clinically normal since that time.

brought a large number of the patients back.

Of the ten teeth which after exposure were treated with silver nitrate and capped, two were extracted after one month because of severe pain and two patients did not return for check-up. The other six teeth were vital at the time of check-up. (Table 4.) Roentgenograms of a tooth whose pulp was capped are shown in Figure 4.

COMMENT

Removal of all carious material in cavity preparation is of paramount importance. Far too often, pulpal inflammation and devitalization of teeth result from caries, whether primary or secondary, under old fillings. Whether this decay is due to the negligence of the operator or to inadequacy of the method used for the sterilization of the dentin is of only secondary interest now. When it comes to deciding whether (1) to remove the remaining decay and expose the pulp or (2) to treat conservatively by allowing the carious dentin to remain and attempting to induce secondary dentin formation, the second alternative must always be taken. This is in accord with the views expressed by Carrington, Roberts, Prime and many others. We say "always," however, with some reservations. Naturally, this does not apply to cases in which extremely soft, disorganized tissue must be left. Nor does it apply to adult teeth (or children's) where the vitality of a tooth is decreasing; but treatment of this sort has its greatest efficacy in young permanent teeth where devitalization is impractical and extraction will certainly affect the dental health of the child. That treating with ammoniacal silver nitrate will not devitalize deciduous teeth has already been amply demonstrated by Ireland, and the present paper offers conclusive evidence that ammoniacal silver nitrate will not devitalize a permanent tooth, even when the silver nitrate is applied directly to an area of exposure. (This type of treatment is not advocated. Exposed pulps were treated with silver nitrate merely to show that the use of silver nitrate would not cause devitalization.) The only analogous piece of work that we can find is a reference in the literature by Polus, who successfully used a paste made of Howe's silver nitrate, zinc oxide and eugenol to cap seventy-five pulps which were accidentally exposed.

TABLE 1.—DISTRIBUTION OF PATIENTS ACCORDING TO AGE.

Age	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Number of Patients	1	1	1	1	4	5	12	6	9	5	11	12	14	7	7	2	1	1	1	1

TABLE 2.—DISTRIBUTION OF PATIENTS ACCORDING TO NUMBER OF TREATMENTS AND NUMBER OF CHECKUPS.

NUMBER of TREATMENTS	1	2	3	4	5	TOTAL
TEETH TREATED	57	57	52	28	10	204
TEETH CHECKED	21	28	26	12	6	93

SUMMARY

The antipathy of the dental profession, as a whole, toward silver nitrate can be attributed to:

1. Discoloration of the tooth. This is definitely an objection, contraindicating the use of the drug in the anterior part

of the mouth for esthetic reasons. However, if handled judiciously, this objection can be eliminated. After the tooth has been treated with silver nitrate, the entire cavity and even the cavosurface angle is stained black. If the tooth is filled in this condition, the translucency of the enamel is affected, a gray to grayish blackness resulting. This can be eliminated if the walls of the cavity are planed down to normal dentin, as suggested by Prime, before the filling is inserted. The black hue is allowed to remain over the pulp, however.

TABLE 3.—INTERVALS AT WHICH TEETH WERE CHECKED.

NUMBER OF MONTHS CHECK-UP	NUMBER OF TREATMENTS 1	2	3	4	5	TOTAL
7	2	3	0	0	0	5
8	0	5	1	1	0	7
9	1	1	1	0	0	3
10	0	0	2	1	0	3
11	2	1	0	0	1	4
12	3	8	4	1	2	18
13	2	1	3	3	0	9
14	5	6	3	1	0	15
15	5	0	5	0	1	11
16	0	0	1	0	0	1
17	0	0	1	3	0	4
18	1	3	4	2	2	12
Total	21	28	26	12	6	

2. Pain upon administration. The application of silver nitrate to a deep cavity is attended with severe pain, which can be practically eliminated by applying eugenol to the cavity, first, and then the silver nitrate. However, this method is of little value as the silver nitrate is reduced before acting on the underlying dentin. The method of application described in this paper prevents most, if not all, of the pain symptoms.

3. Fear of pulp devitalization. This fear is justified, since many teeth have been devitalized by silver nitrate. However, we believe that when pulps have been devitalized, it was the operator who was at fault and not the silver nitrate. Silver nitrate is a severe protoplasmic caustic. When it is placed in a deep cavity immediately over the pulp in an adult tooth which has already been irritated by caries, and in which there has been little secondary dentin formation, we cannot expect resolution of this extremely fragile organ to take place. If the pulp is healthy and in good condition, it may, and usually does, overcome the irritation. The presence of secondary dentin prevents the pulp from being irritated too much. However, in some cases, a pulpitis results which is sufficient to cause death or atrophy of the already involved pulp. We wish to emphasize the point that a pulp which is devitalized by silver nitrate has already exhibited pulpitis. We agree whole-heartedly with Cleary that "when the death of a pulp ensues following the application of silver nitrate, the death occurs in spite of, rather than because of, the action."

The widest application of silver nitrate therapy for deep-seated caries is in the field of children's dentistry; i.e., for deciduous and young permanent teeth. Ireland has already investigated the use of silver nitrate in deciduous teeth. One hundred teeth were treated and in no cases could devitalization be detected. We worked on young permanent teeth and a small percentage of deciduous teeth and the results convinced us that, in young permanent teeth, devitalization with silver nitrate is extremely doubtful.

The profession generally accepts silver nitrate because silver nitrate has long been recognized as a powerful antibacterial agent. Barker tested various germicides for their action on slabs of dentin infected *in vitro* with organisms from carious cavities. He found that Howe's silver nitrate was the most effective of all the germicides tested. However, *in vivo* results often differ from

those found in the test tube. One of us (S. S.), working on the comparative value of various medicaments in carious dentin *in situ*, found that silver nitrate was far outranked by other medicaments in the sterilization of dentin. The conclusion was that to call silver nitrate a sterilizing agent is a misnomer. That it is bacteriostatic is not questioned, but it is far too caustic and self-limiting to kill bacteria in the dentin outright. In two cases, we removed the fillings of teeth that had previously received silver nitrate treatment. Shavings from the dentin were removed aseptically and cultured. Both cases yielded growths of bacteria.

Numerous investigators have constantly called attention to the caries-inhibiting power of silver nitrate. This is the factor that gives it its greatest value.

The inhibiting action of silver nitrate is lost if it is not reduced. The use of eugenol for this purpose is to be recommended, for, as Prime (1937) pointed out (quoting Va Verka), "if formalin is used as a reducing agent the basicity of the original solution is overcome and tends to leave the system with a pH below seven, well on the *acid* side, owing to formic acid formation." On the other hand, reduction with eugenol leaves the pH on the alkaline side and the reduction of the silver is more nearly complete.

We believe that silver nitrate owes its inhibitory action more to an induction of secondary dentin formation by the pulp than to any sterilizing action. Although it is true that the albuminate formed does not serve as a pabulum for bacterial nourishment, the reduction of the drug does not extend to any appreciable depth into the underlying dentin unless most of the decay is removed. Bacteria are present in the dentinal tubules far in advance of the visible carious process. These bacteria remain alive even after silver nitrate action. Bryan noted that "deep soft dentin continued to decay under the blackest layer of superficial dentin which has been saturated every four months for several years with 40% silver nitrate." However, the stimulated pulp lays down secondary dentin rapidly and in abundance. As a result, any bacteria which remained alive are bottled on the pulpal side by secondary dentin and on the other side by coagulated albumin.

We can recall at least ten cases in which we took out old fillings and found

TABLE 3.—FATE OF TEETH WHOSE PULPS WERE EXPOSED, TREATED WITH SILVER NITRATE AND CAPPED.

TIME OF CHECK-UP AFTER PULP CAPPING	CLINICAL HISTORY
1 Month	2 Extracted Because of Pain
9 Months	1 Vital and Clinically Normal
10 Months	1 " " " "
12 Months	2 " " " " 1 No Check-up
14 Months	1 Vital and Clinically Normal
16 Months	1 " " " "
18 Months	1 No Check-up

under them dentin that had been treated with silver nitrate. In all these cases, carious material could be removed. Under this, the dentin was very hard. Roentgenograms of these teeth revealed caries immediately under the fillings and broad white zones of secondary dentin under the carious tissues.

CONCLUSIONS

1. Many borderline cases of deep-seated decay can be saved by the judicious use of Howe's ammoniacal silver nitrate.

2. It is not necessary to remove that "last trace of decay," this procedure often resulting in pulp exposure.

3. Howe's ammoniacal silver nitrate cannot be held responsible for the devitalization of a pulp.

4. The use of silver nitrate therapy in deep dental caries should be restricted to deciduous and young permanent teeth.

5. The greatest value of the type of treatment advocated is to give the pulp time to lay down a protective barrier of secondary dentin.

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TRAUMATIC ANEURYSM OF THE INFERIOR DENTAL ARTERY

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GENERAL CONSIDERATIONS

OBSTINATE hemorrhage from the alveolus following tooth extraction is relatively common. It is the result of injury to an abnormally large nutrient vessel, when not due to hemorrhagic disease (purpura, anemia, avitaminosis, hemophilia, liver disease, scurvy, allergy, etc.). The mechanical hindrance to the natural arrest of hemorrhage from large vessels in bone is well known. Direct application of pressure to the wound in the bone by packing, supplemented by the use of coagulants, is necessary for permanently controlling this type of bleeding. Disease of the vessel supplying the area should be suspected when repeated hemorrhage follows the removal of packs.

The mandible is unique in possessing a large nutrient artery within the lower half of its ramus and the greater part of its body. This nutrient vessel is intimately related to the apices of the teeth, and the roots of the third molar may invade the mandibular canal. In fact, the inferior dental vessels and nerve may pass in rare cases through a foramen formed by fusion of the roots of this tooth. Therefore, injury and loss of normal bone support to a portion of the inferior alveolar artery are possible during tooth extraction. An unusual case of this type of obstinate bleeding came under our care, following removal of a vertically impacted left cystic mandibular third molar. (Fig. 1.)

From the Thomas W. Evans Museum and Dental Institute, Dental School, University of Pennsylvania.

REPORT OF CASE

The patient, a woman, aged 27, gave no history of previous bleeding. The tooth was enucleated by an elevator after the buccal alveolar plate was chiseled away through an incision made in the gum tissue under conduction anesthesia. There was the usual welling up of blood, which was readily controlled by suture and pressure. Inspection of the extracted tooth revealed a cystic mass adhering to the root. Unfortunately, the tooth was discarded and hence microscopic study was not possible. Nothing unusual occurred until the fifth day, when the patient complained of throbbing pain in the jaw and paresthesia of the lower lip of the same side. Inspection revealed that the wound was bulging, and when the sutures were removed, the blood clot was found disintegrated and putrid. An arterial hemorrhage, which could not be completely controlled for about an hour, followed irrigation. Hemorrhage was finally controlled by pressure and resuture.

Pain recurred, seven days later, with further bulging of the wound and severe arterial bleeding. The patient was then admitted to the Episcopal Hospital of Philadelphia, where the bleeding alveolus was emptied of its contents and packed with iodoform gauze under general anesthesia. A slight fever developed on the third day, when the packing was removed, and a characteristic systolic surge was immediately evident. The cavity was repacked with medicated petrolatum gauze, which was removed gradually over a period of eight days. At this time, bleeding did not recur

and the patient returned home. Hemorrhage developed forty-eight hours later, when repacking was deemed necessary. The packing was finally removed after several days of gradual reduction. A pulsating bluish mass was then noted in the tooth socket. The patient complained of return of paresthesia in the lip and a buzzing sound on the affected side with each cardiac systole. The blue pulsating mass ruptured on gentle manipulation and the usual systolic hemorrhage followed.

A roentgenogram (Fig. 2) at this time revealed an enlarged alveolus in direct communication with the mandibular canal. The condition was then diagnosed as a traumatic aneurysm of the inferior dental

Fig. 1.—Left cystic mandibular third molar; showing cystic area about fused roots.

Fig. 2.—Enlarged alveolus in communication with mandibular canal some time after enucleation of left third molar. This is the site of a traumatic aneurysm of the inferior dental artery. There is loss of bone support about the mandibular canal.

artery and the patient was advised to submit to ligation of the external carotid artery. The wound was kept packed for another week, during which the patient was considering an operation. A serious hemorrhage recurred within a day or two of removal of the pack. The patient finally yielded and was readmitted to the hospital. The external carotid artery was ligated by one of us (J. H. G.). The wound in the mandible was gently curetted and lightly packed with iodoform gauze. Bleeding at this time appeared as a gentle oozing of bright red blood. The packing was replaced, after four days, by a much smaller pack and was discontinued after four more days. The patient was discharged from the hospital on the tenth day with only slight seepage on one or two occasions within the following five days. A series of roentgenograms (Figs. 3 and 4) taken since healing reveal gradual filling and ossification of the diseased alveolus, with complete regeneration of the mandibular canal.

Blood studies during the course of this hemorrhage revealed no blood dyscrasia, a negative Wassermann reaction, hemoglobin varying from 65 to 82 per cent and a bleeding time of from one and a half to three minutes.

Fig. 3.—Partial filling and healing of alveolus of left third mandibular molar some time after enucleation of tooth.

Fig. 4.—Completely filled and ossified alveolus of third molar, showing regeneration of the mandibular canal. (Compare Fig. 2.)

The case just cited is suggestive of a traumatic aneurysm of the inferior dental artery. The clinical course of severe hemorrhage following enucleation of the cystic left third mandibular molar is very unusual.

REVIEW OF THE LITERATURE

Traumatic aneurysm of the arteries is

fairly common in surgery. Aneurysm of the inferior dental artery, on the other hand, is a surgical curiosity, as evidenced by a review of the literature.

Etchepareborda, in 1910, reported a case in a patient aged 17, with an aneurysm of the left inferior dental artery in the last molar region.

Aronson, in 1929, reported the case of a woman, aged 22, with an aneurysm of the inferior dental artery extending from first to third mandibular molars and the size of a walnut.

In 1929, Campos Igual reported a patient with cirsoid aneurysm of the inferior dental artery about an impacted first molar producing loosening of the second and third molars. The case ended fatally from general sepsis following an operation.

Kalinejke, in 1934, reported an aneurysm of the inferior dental artery in the first molar region the size of a cherry and occurring three years after extraction of the first mandibular molar, in a woman, aged 22.

COMMENT

A localized pulsating distention of an artery is known as an aneurysm. An arterial aneurysm is due to weakening of the arterial wall from damage to the tunica media. Syphilis leads to localized damage of the tunica media of large arteries and is the main cause of aortic aneurysm.

Aneurysms of small vessels do not commonly result from syphilis because the tunica media of these small vessels is seldom involved by this disease. The tunica intima is the usual site of involvement in aneurysms of small arteries. Infectious diseases such as tuberculosis and abscess cause a predisposition to aneurysmal formation.

Aneurysms may occur anywhere in the body, but occur more frequently along the aorta.

An aneurysm may be true, false, saccular, traumatic or arteriovenous.

Traumatic aneurysms follow trauma in the form of laceration, incision or contusion of the arterial wall. The artery may become simply weakened, this leading the weakened area to distend in all directions. Partial division of an artery and healing of the wounded vessel permit slow dilatation of the repaired segment, thus forming a circumscribed traumatic aneurysm (saccular or lateral aneurysm).

Examination of Figure 1 reveals a radiolucent cystic area surrounding the apices of the fused roots of the third left mandibular molar. The question naturally arises as to what part this radiolucent area occupied by the dental root cyst played in predisposing the patient to traumatic aneurysm. There was no apparent evidence of rupture of the artery at operation. Loss of normal bone support to the traumatized vessel is apparent in Figure 2. The aneurysm can therefore be explained on the following basis:

The outer and middle coats of the inferior dental artery were unquestionably torn during operation. The blood filling the empty alveolus coagulated and gave temporary support to the traumatized blood vessel. Postoperative infection and disintegration of the blood clot set in before adequate organization of the wound in the bone occurred. The tunica intima of this damaged blood vessel bulged into the alveolus and a traumatic aneurysm resulted.

SUMMARY

A 27-year-old woman had a vertically impacted left cystic mandibular third molar removed as a prophylactic measure under local anesthesia. As is not unusual, bleeding followed immediately. The gum flaps were sutured and pressure was applied.

Symptoms of irritation of the inferior dental nerve developed five days

later. The blood clot disintegrated and severe arterial hemorrhage occurred, following irrigation of the alveolus.

A bluish pulsating mass was noted in the tooth socket after three weeks of continuous packing to control hemorrhage. This was accompanied by paresthesia of the lip and throbbing synchronous with each cardiac systole.

The bluish sac ruptured, severe systolic hemorrhage reappeared, the bruit ceased and the paresthesia disappeared on slight manipulation.

The hemorrhage ceased and normal healing of the tooth socket occurred after ligation of the external carotid artery.

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DANGERS OF EXTENSIVE OPERATIVE PROCEDURE ON RECENTLY ERUPTED TEETH

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THE cause of the death of pulps under jacket crowns is often a subject of discussion. Both patient and dentist are, to put it mildly, disappointed when an abscess forms six months or a year after completion of a beautiful piece of work. There seems to be little doubt that many pulps die as a result of such operations, but they do not necessarily become putrescent. The reason for this lack of symptoms is that not all dead pulps are infected; hence, no one suspects their condition. A sterile, devitalized pulp may show no clinical symptoms for a great many years; hence, both patient and dentist are none the wiser.

An attempt will be made to describe the types of teeth that are poor risks for jacket crowns as well as to show some of the reasons why pulps die after these and other extensive restorations.

The teeth have been regarded as virtually inert structures during the past fifty years. That there was a blood supply to the pulp was obvious, but it was not believed to have any function beyond that of forming secondary dentin. The lack of a biologic concept of dentistry has led the profession to consider that the placing of fillings and crowns requires only digital dexterity. Operative dentistry certainly calls for skill and endless patience, in order to render good service to the public. But that apparently is not all. It seems now that a knowledge of histology can be an aid in further improving this service. Very little practical application has been made of histology and the allied field of dental physiology. Investigation has always

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been discouraged in the subject of dental physiology because of the long-held concept that no activity whatever occurs in a tooth after it takes its place in the mouth. The fact that blood surges in and out of each tooth, as it does in all the other organs of the body, apparently has no significance to the majority of the scientists. Histologic study of recently erupted teeth and those that have been in the mouth for ten or more years reveals structural differences. It shows that operative procedures affect the teeth

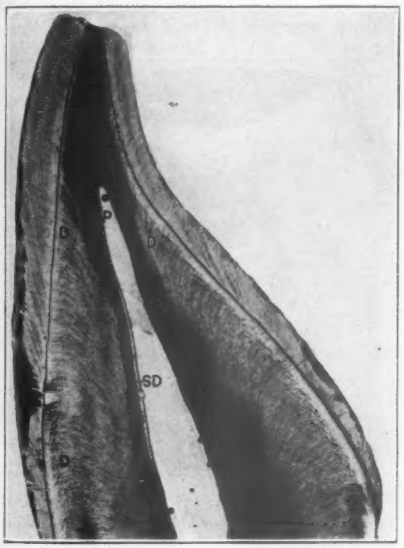

Fig. 1.—Tooth that is poor risk for jacket crown; incisor in labiolingual section with abnormally large pulp chamber (P) extending close to incisal edge in spite of attrition. Its position can be defined only by a roentgenogram. Irritation caused by operative procedures would penetrate dentin (D) readily, owing to its high permeability and slight secondary dentin formation (SD). More impermeable dentin (blocked tubules) is present only in the incisal and lingual portions. Successful jacket crown preparation is possible only if great care is exercised.

and, finally, that many fillings and crowns would be unsatisfactory were it not for the wonderful adaptability of Nature. A knowledge of the effect of operative technic and filling on the dentin and pulp will aid the dentist in selecting compatible filling materials and following a proper operative procedure. A brief review of the histology of the dentin is necessary to comprehension of this subject.

The dentin is composed of a matrix or basis substance through which a great number of channels pass from the pulp toward the surface of the tooth. These

Fig. 2.—Tooth that is poor risk for jacket crown; acute caries (C) entering from proximal surface and affecting a highly permeable cuspid (labiolingual section). The large pulp (P) is pathologic, showing three pulp nodules (PN) and little secondary dentin (SD). Great care is required for successful jacket crown preparation.

channels, termed dentinal tubules, contain fibrils, processes of the odontoblasts of the pulp. These fibrils have now been shown to be hollow, containing a fluid, termed the dental lymph. The fact that a fluid diffuses through the dentin into

the enamel has been demonstrated recently[1] by animal and human experiments. The presence or absence of the dental lymph affects certain types of operative procedures, which have been discussed previously.[2, 3, 4]

When a tooth erupts, all dentinal tubules are filled with dental lymph. After five or more years, changes take place in the dentin as well as in the enamel, owing to a desiccation of the dental lymph in localized areas which makes these areas less permeable. This

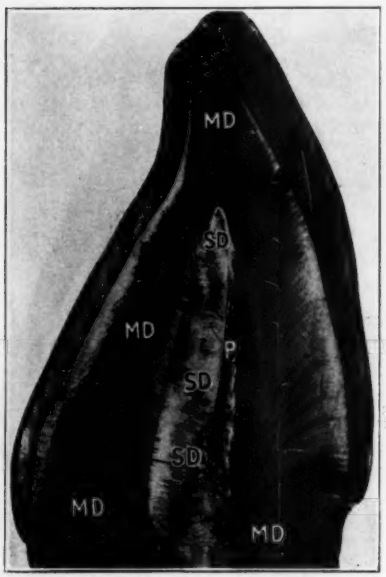

Fig. 3.—Tooth that is good risk for jacket crown; highly matured maxillary incisor having dentin of low permeability (MD). The pulp (P) has dwindled to a mere thread. Masses of secondary dentin are seen (SD). Operative procedures can barely affect the pulp unless great heat is generated.

change we have termed protective metamorphosis because the presence of these areas reduces the transmission of external irritation to the pulp and also retards carious activity. These changes can be regarded as a type of maturing, which is hastened by attrition, a slow wearing down of the teeth by mastication. Exact knowledge as to when the process of maturation begins or is completed is not available, because it progresses faster in some persons than in others.

External irritation, such as attrition through mastication, causes the formation of secondary dentin in the pulp, which results in a blocking of many tubules passing toward the surface. The formation of secondary dentin also hastens the protective metamorphosis of the dentin. For the sake of brevity, the dentin of recently erupted teeth, which is highly permeable, will be called "im-

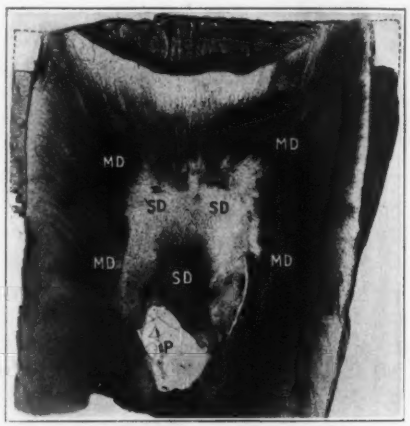

Fig. 4.—Tooth that is good risk for jacket crown; highly matured premolar in mesiodistal section. The tubules in the dentin have been blocked (MD). The pulp chamber (P) is almost filled with secondary dentin (SD). Irritation from operative procedures can affect the pulp only slightly unless considerable heat is generated.

mature dentin," and that of older teeth, in which the permeability is reduced, "mature dentin."

With the knowledge of the changes that age and external irritation cause in the dentin, let us examine some photomicrographs of teeth with the idea of placing jacket crowns. Although this paper stresses jacket crowns, the subject is not intended to be limited to this type

of reconstruction. Jacket crowns are emphasized because they are frequently resorted to in young persons whose teeth are highly permeable and because the preparation necessary for placing them as well as other types of crowns affects the dentin and the pulp more than does any other reconstruction. Even small inlays affect the dentin and the pulp, but naturally to a lesser extent on account of involving a smaller area.

The difference between teeth that are good risks and those that are poor risks can be summarized as follows:

Teeth that are poor risks for jacket crowns (Figs. 1 and 2): (1) those of persons under 30 years of age; (2) those showing no attrition by mastication; (3) those with pulp extending far into the crown, and (4) those having little or no secondary dentin.

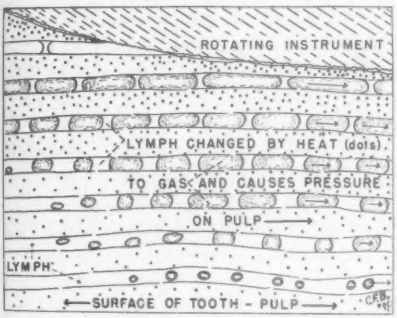

Fig. 5.—Heat (dots) caused by rapid operative technic expanding or even volatilizing dental lymph in tubules, causing pressure on pulp.

These facts suggest that the dentin is highly permeable, which allows external irritation, originating from operative procedures, to penetrate to the pulp.

Teeth that are good risks for jacket crowns (Figs. 3 and 4): (1) those of persons over 30 years of age; (2) those showing attrition involving the dentin; (3) those the pulps of which have receded from the crown, and (4) those having considerable secondary dentin.

These conditions reduce the permeability of the crown dentin, thus preventing irritation, originating from operative procedures, from reaching the pulp.

No doubt, many are thinking that it is difficult to define all the factors which make a tooth a good or a poor risk for a jacket crown as long as it is still in the mouth and cannot be examined microscopically. They may wish to know whether all these conditions can be defined clinically. Information concerning the following factors will be an aid in such a determination: (1) age of patient, (2) degree of attrition, (3) type of dental caries and (4) x-ray findings.

1. *Age of Patient.*—Mention was made at the beginning of this paper that the dentin of teeth of young persons is highly permeable or porous (immature); hence, these teeth are poor risks for jacket crowns. The age at which a certain degree of protective metamorphosis commonly occurs in the crown dentin varies from ten to fifteen years after the eruption of the tooth. Reduced permeability also is dependent on the condition described in the next paragraph.

2. *Degree of Attrition.*—The wearing down of the incisive edges and occlusal surfaces of the teeth, particularly when dentin becomes exposed, causes a rapid protective metamorphosis of these areas. As previously mentioned, it also promotes the formation of secondary dentin, causing the pulp to recede. Worn teeth usually are good risks for jacket crowns, although exceptions are noted (Fig. 1) and decision must be reserved until roentgenograms are made.

3. *Type of Dental Caries.*—Dental caries is another form of irritation which will stimulate some pulps to form secondary dentin. However, in certain cases, the pulps seem to be unable to develop this protective tissue; hence, roentgenograms will have to be relied upon to define the exact locations of the pulp chamber. The chronic or slow type

of dental caries[5] gives the pulp a greater opportunity to form protective secondary dentin than does the acute or rapid type. Teeth, therefore, having the chronic type of caries usually are good risks for jacket crowns.

4. *X-ray Findings.*—Routine x-ray pictures are usually of little value in determining the exact position of the pulp chamber. This is particularly true of the six upper anterior teeth. The angle at which the roentgenograms should be taken is that used for bitewing films, but the ordinary exposure should at least be doubled to define exactly the location of the horns of the pulp.

The subject of risks in jacket crown work is closely related to that of the manner in which pulps can be harmed by these extensive restorations. This phase of the paper is really a most important part of the subject, because a careful operator may prepare teeth successfully for jacket crowns that would prove to be poor risks in the hands of an indifferent dentist. The reason for this statement will become clear after consideration of the means by which pulps may be harmed by extensive operative procedures. These are: (1) heat, from a rapid operative technic[4]; (2) irritation, from the impression technic, and (3) the chemical effects of the cementing material.

Of these three means, the first is of prime importance. A great many pulps are harmed by heat during the rapid preparation of a tooth without the knowledge of either patient or operator, because procaine anesthesia is often used during the extensive preparation necessary for jacket crowns on vital teeth and the patient loses an important defense mechanism—pain—which would otherwise sound the alarm and protect the pulp from permanent harm. Anesthesia permits the dentist to operate at high speed; which shortens the session for both the patient and the dentist, to the satisfaction of both. Operators frequently are proud of the fact that they can prepare a tooth for a jacket crown in a shorter time than other dentists, but in doing so are unconscious of the harm they do. One way in which pulps are harmed through heat, generated by a rapid operative technic, is shown in Figure 5. The dental lymph in the tubules is expanded and finally changed to a gas through the heat generated by a rapidly revolving instrument. This gas naturally expands and escapes to the outside wherever the dentinal tubules are cut. However, the majority are still covered by enamel; hence the pressure passes to the pulp and causes harm to this delicate tissue. In the absence of anesthesia, this pressure would cause excruciating pain to the patient and force the dentist to operate more slowly. Although with anesthesia the patient feels nothing, the pulp tissue may be permanently harmed by the pressure.

A second source of harm to the pulp is the heat itself. The pulp can be literally "cooked in its own juice" and die. Pulps of teeth destined for jacket crown or other large reconstructions are often normal, i.e., not infected, consequently no subjective symptoms follow their death. It is only when a chance infection is carried to a dead pulp by the blood stream that an abscess results. This explains why comparatively few dead pulps are discovered under jacket crowns and suggests that many unsuspected, devitalized pulps are present in teeth carrying crowns and bridge abutments.

Another condition that may harm teeth during jacket crown preparation is irritation to the pulp from the impression technic. This subject has been discussed at length in the dental literature, and it is clear that the pressure brought to bear on a prepared tooth during impression taking can cause harm to the dental pulp, particularly in a young person whose dentin is highly permeable. Such a pressure will be transmitted to the pulp through the open dentinal

tubules of the immature dentin and harm this delicate organ. Dentin of the teeth of older persons has matured and pulps are not so easily harmed because the pressure cannot penetrate the blocked tubules.

A third and final condition that may harm the pulp is the chemical effect of cementing material. It is generally conceded that the phosphoric acid in oxyphosphate cement has an irritating effect upon the pulp. This is more intense when applied to immature dentin on account of the high permeability of the dentinal tubules. If, however, many of these are blocked, as is the case in mature dentin, the irritation cannot affect the pulp so readily. A slight amount of irritation is beneficial to the pulp in the treatment of simple cavities as this slight irritation will stimulate the pulp to form secondary dentin. In contrast to the views of some writers, I advocate the use of temporary fillings of oxyphosphate cement in hypersensitive cavities of immature teeth.[3] Experience has shown that the sensitiveness disappears and the pulps remain vital. In most cases involving fillings, the area of dentin through which the irritation reaches the pulp is comparatively small. In the case of a jacket crown preparation, however, nearly all tubules of the crown dentin are open. This condition affects a considerable part of the pulp, and this potent source of irritation must be taken into account and prevented. The ill-effects of the impression technic and the chemical effects from the cementing material can be obviated by the use of varnish before taking the impression.

SUMMARY

1. Teeth are now known to react to operative procedures. The more extensive these are, the greater are the changes in the dentin and the pulp.

2. If the irritation is slight, such changes are beneficial; if it is excessive, it can be harmful, resulting even in the death of the pulp.

3. Teeth selected for full or three-quarter crowns can be classified as good and poor risks.

4. Dentists should operate even more slowly under procaine anesthesia than without it, because pulps are often devitalized by the heat of rapidly rotating instruments. The flow of blood is reduced by the use of epinephrine, permitting the pulp to be subjected to an even higher degree of heat.

5. Irritation of the pulp should be minimized by the use of varnish, particularly after the extensive preparations necessary for crowns and large inlays.

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EFFECTS OF SODIUM BISULFITE IN LOCAL ANESTHETIC SOLUTIONS

By M. L. Tainter, M.D.; A. H. Throndson, D.D.S., and H. M. Leicester, Ph.D., San Francisco, Calif.

IN 1937, it was pointed out by us that sodium bisulfite is commonly used in local anesthetic solutions as a preservative for the vasoconstrictor ingredient.[1] It was demonstrated that bisulfite is a highly acid salt producing a sufficient degree of acidity to be irritating. Actual tests revealed that solutions containing sodium bisulfite caused chemosis when dropped in the eye, and also inflammatory reactions in subcutaneous tissues when injected both in animals and in human subjects. It was suggested that the bisulfite was not indispensable, and that some other compound should be used which would serve as an anti-oxidant, but would not require the high acidity of bisulfite solutions.

Shortly after the report was published, the question was raised as to whether the sodium bisulfite used was an authentic specimen, or perhaps was contaminated by free acid, since the pH values reported were lower than were expected from the chemical nature of the compound. (Calvery.) In view of this question, and since no adequate test appeared to have been made previously on patients as regards possible irritation from local anesthetic solutions containing bisulfite, it was believed worth while to study the problem more thoroughly. It was decided to measure the changes in pH under a variety of conditions, to determine whether and how the presence of this anti-oxidant modified the clinical response to anesthetic solutions. This report presents further chemical results on local anesthetic solutions containing sodium bisulfite, and observations on patients which bear on its clinical desirability.

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CHEMICAL RESULTS

The local anesthetic solutions on the market contain sodium bisulfite in concentration of 0.1 to 0.2 per cent.[10] In the previous paper,[1] it was reported that when 0.1 per cent of this salt was dissolved in a physiologic solution of sodium chloride, the resulting pH was 2.12, and, when it was added to a procaine-epinephrine solution, such as is used in oral surgery, the pH was 2.83. It has been shown by Pecker[2] that solutions of sodium bisulfite decompose on standing. In a more detailed study,[3] Foerster and Haufe reported that this decomposition followed the equation of $4\ NaHSO_3 \rightarrow Na_2\ SO_4 + Na_2\ S_2O_3 + H_2O + H_2SO_4$. In this reaction, the hydrogen ion acts as a catalyst and the process is therefore autocatalytic. As a result of this decomposition, there is produced one half a normal equivalent of sulfuric acid for every gram molecule of bisulfite decomposed.

In this study, determinations have been made of the initial and progressive changes in hydrogen-ion concentration of solutions of bisulfite under a variety

of conditions. The pH measurements were made with a glass electrode and colorimetrically using the nitrophenol indicators of Michaelis,[4] which were checked against buffers.

The first measurements were made on the same lot of sodium bisulfite (Baker C.P., lot number 1433) as used in our previous report. One-half of 1 per cent of this bisulfite in distilled water or salt solution had a pH of 3.6 when first dissolved, but this dropped to 3.2 at the end of twenty-four hours, and to about 1.7 in four weeks, as shown in Table 1. These values, which are within the range of those observed by us previously,[1] indicate that the reason for the high acid values in that report was that the pH values were not measured on the same days that the solutions were prepared. In the belief that this original lot of bisulfite might have been contaminated by free acid, a purified salt was made from it by precipitation from alcohol. When 0.5 per cent of this was dissolved in distilled water, the pH was 5.2; indicating that some acid impurities had been removed by the precipitation. However, in twenty-four hours, the pH value dropped to 4.0, and, in forty-eight hours, to 2.8, this specially purified material decomposing even more rapidly than the original sample. These observations, therefore, indicated that the purity of the bisulfite made some difference in the initial pH of the solutions, but that this difference did not persist more than a few hours.

TABLE 1.—RATE OF DECOMPOSITION OF SODIUM BISULFITE SOLUTIONS USED TO PRESERVE LOCAL ANESTHETICS AND VASOCONSTRICTORS AS MEASURED BY CHANGE IN pH

Days	Sodium Bisulfite C.P.* 0.5%			Procaine 2% and Epinephrine 1:50,000 in 0.45% Sodium Chloride		
	In Distilled Water	In 0.9% Sodium Chloride	Recrystallized in Distilled Water	Without Sodium Bisulfite	0.1% Sodium Bisulfite C.P.*	0.1% Sodium Bisulfite Analytic Reagent†
(Fresh)	3.6	3.6	5.2	4.9	4.7	4.8
1	3.2	3.2	4.0	4.9	4.3	4.4
2	3.1	3.1	2.8	4.9	4.3	4.3
3	2.8	3.0			4.2	4.3
5				4.9	4.0	4.1
6					3.9	4.1
7					3.8	3.9
9					3.7	3.8
12				5.1	3.6	3.8
16					3.6	3.8
27	1.79	1.71				
28	1.79	1.83				
37				5.0	3.3	3.4

*Baker brand.
†Mallinckrodt brand.

The next proposition was whether this particular sample of sodium bisulfite was atypical or whether bisulfite from other manufacturers reacted similarly. Five new samples of sodium bisulfite were obtained in the open market, consisting of "Mallinckrodt's analytical reagent," "Mallinckrodt's purified dry," "Eastman practical," "Baker and Adamson dry" and "Braun-Knecht-Heiman's

65 to 66%." All seven samples were dissolved in a physiologic solution of sodium chloride to make 0.1 per cent strength, and the pH values were determined by the glass electrode.

When freshly dissolved, the most alkaline solution was the least pure, with a pH of 4.22, and the most acid was the original bisulfite, with a pH value of 3.32, the others ranging between. There was a marked increase in the degree of acidity twenty-four hours later, when the drop in pH values averaged 0.47. Thus, while there were differences in the degrees of acidity of the freshly prepared solutions made from bisulfite of different manufacturers, these differences were smaller than the change which occurred in as short a period as a few days. These results, therefore, indicated that the purest commercially available sodium bisulfite was extremely unstable in solution, and that the various commercial products did not differ significantly in this respect. The observations were not continued beyond twenty-four hours, since other data were available showing that the changes progressed beyond that period.

However, bisulfite is not used in pure sodium chloride solution, but rather in solutions containing procaine, epinephrine and the other necessary ingredients of local anesthetics. Procaine hydrochloride 2 per cent in sodium chloride solution had a pH value of 5.4, which was decreased to 4.7 by adding 0.1 per cent sodium bisulfite. This value was considerably less acid than that of sodium bisulfite in pure water, since procaine and other ingredients of local anesthetic solutions tend to buffer the reaction toward neutrality. The question arose as to how effective this buffer action was in preventing the acid shift in pH as the solutions aged.

To test this, a standard solution was made, such as is used for local anesthesia in oral surgery, consisting of procaine hydrochloride 2 per cent, sodium chloride 0.45 per cent and epinephrine 1:50,000 dissolved in distilled water. The epinephrine was added as a small volume of the commercial 1:1,000 solution, which contained 0.1 per cent sodium bisulfite, thereby causing a slightly greater initial acidity than would have been the case if bisulfite-free epinephrine had been used. However, as nearly all commercial epinephrine solutions contain bisulfite, this more

TABLE 2.—AMOUNT AND DISTRIBUTION OF DATA IN CLINICAL COMPARISON OF BISULFITE-CONTAINING AND BISULFITE-FREE LOCAL ANESTHETIC SOLUTIONS*

Solution	Total Number of Patients	Total Number of Injections	Average Injections per Patient	Type of Injection: Number and Percentage of Total Cases		
				Mandibular	Tuberosity	Infra-Orbital
Bisulfite-free	195	313	1.60	132 42.2%	81 25.9%	100 31.9%
Bisulfite 0.1%	123	193	1.57	72 37.3%	59 30.6%	62 32.1%
Totals	318	506	1.59	204 40.3%	140 27.7%	162 32.0%

*Both solutions contained 2 per cent procaine hydrochloride and 1:50,000 epinephrine in 0.48 or 0.7 per cent sodium chloride solutions.

closely represented clinical conditions than otherwise.

To one portion of this anesthetic solution was added 0.1 per cent of the original sodium bisulfite, and to another portion, the same amount of the purer Mallinckrodt specimen. Table 1 shows that the control local anesthetic solution, without added bisulfite, had an initial pH value of 4.9, which after thirty-seven days was practically unchanged at 5.0. After the first day, the solution started to turn yellow, this indicating some decomposition; but no pH changes resulted. That portion of the solution, preserved with the original Baker's bisulfite, had initially a pH value of 4.7 and dropped to 4.3 within twenty-four hours and in thirty-seven days, to 3.3; a total drop of 1.4 pH units. The Mallinckrodt bisulfite solution had an initial pH of 4.8, and a pH of 3.4 at the end of the thirty-seven days, showing an identical drop.

When these observations were discontinued, the solutions apparently had not yet reached the end of the decomposition process, since further changes were still being demonstrated. Therefore, the presence of the procaine and epinephrine slowed down the rate of development of the acid reaction, probably through the buffering power of the nitrogen groups in the procaine and epinephrine, but did not prevent the change.

It might be expected that the final pH value would be the same as would be obtained if the equivalent amount of acid, corresponding to complete decomposition of the sodium bisulfite, were added to the solution. When this amount of acid was added to the procaine-epinephrine solution, a pH of 3.6 resulted. Since our anesthetic solutions

TABLE 3.—COMPARISON OF AVERAGE EFFECTS OF ANESTHETIC SOLUTIONS CONTAINING SODIUM BISULFITE WITH BISULFITE-FREE SOLUTIONS*

Solutions	Volume Required Cc.	Time of Onset of Anesthesia Minutes	Duration of Anesthesia Hours	Pulse Rate Changes Beats per Minute	Blood Pressure Changes (Mm. Hg.)		Respiratory Rate Changes per Minute
					Systolic	Diastolic	
Bisulfite-free	5.83	2.78	2.95	+7.71	+3.59	−3.86	+1.31
Standard Error of Average	±0.213	±0.107	±0.120	±0.876	±0.935	±0.731	±0.269
Bisulfite 0.1%	5.39	2.84	2.69	+5.05	+1.66	−2.31	+1.14
Standard error of average	±0.289	±0.118	±0.238	±1.04	±1.102	±0.898	±0.340
Probability of difference between averages being due to chance	22%	71%	32%	5.0%	18%	18%	70%

*Each solution contained 2 per cent procaine hydrochloride and 1:50,000 epinephrine dissolved in 0.48 or 0.7 per cent sodium chloride solution. To one solution was added 0.1 per cent sodium bisulfite. The standard error values indicate the amount of variability to be expected in the average figures to which they relate. The probability figure represents the odds that the differences between the averages could have resulted from chance. The lower the probability percentages, the greater the chance that the differences are true differences and not the result of accidental fluctuations in the individual figures. The probability figure should be smaller than 5 per cent before it is safe to conclude that a true difference exists between the solutions.

TABLE 4.—FREQUENCY OF IMMEDIATE EFFECTS EXPRESSED AS PERCENTAGES OF NUMBER OF CASES IN EACH SERIES FROM BISULFITE-FREE AND BISULFITE-CONTAINING LOCAL ANESTHETIC SOLUTIONS

Solution	Frequency of Incomplete Anesthesia	Frequency of Painful Injections	Amount of Bleeding			Frequency of Side Actions				Frequency of Completely Satisfactory Anesthesia
			Slight	Moderate	Excessive	Perspiration	Nervousness	Tremor	Fainting	
Bisulfite-free	12.7	13.1	15.5	53.6	30.9	17.1	36.1	20.1	6.2	89.2
Standard error of percentage	±2.28	±1.91	±2.60	±3.58	±3.32	±2.71	±3.45	±2.88	±1.73	±2.22
Bisulfite 0.1%	20.0	14.1	11.9	58.5	29.7	18.3	34.7	8.3	5.8	83.9
Standard error of percentage	±3.58	±2.51	±2.96	±4.54	±4.26	±3.53	±4.33	±2.51	±2.23	±3.30
Probability of differences between values being due to chance	8.5%	75%	61%			78%	80%	0.2%	90%	18%

became more acid than this, there must be other acid reaction products in addition to those indicated in the equation. One possibility is a breakdown of the thiosulfate to sulfurous acid.[5]

As the solutions just discussed were not protected from light and air, it was thought worth while to determine whether these factors might make significant differences in the results. The most completely protected solutions are those marketed in glass ampules, which are shielded from light in sealed boxes. Two of these were obtained from freshly opened packages and the acidity was measured. It was found to be pH 3.67 and 3.68, respectively, and therefore probably one pH unit more than when freshly prepared. Such a change in acidity is produced in the exposed solution in about ten days. Since these commercial solutions were probably many months old, it is evident that storage in sealed ampules in the dark slowed down the rate of breakdown of the sodium bisulfite, but did not prevent it.

These observations, taken all together, make it evident that local anesthetic solutions containing bisulfite decompose from the time of preparation to the final acid end-products. Therefore, the presence of bisulfite in these solutions is the equivalent of adding progressively increasing amounts of acid, with resulting increase in hydrogen-ion concentration with time. The reaction is slowed down, but not prevented, by sealing the solutions in ampules and protecting them from light, and the magnitude of the acid production is obscured by the buffer action of the epinephrine and procaine. These observations pose the practical question as to whether the presence of this unstable agent, or its end-products of decomposition, modifies the clinical effectiveness of local anesthetic solutions, or increases their irritant properties to an extent which would be disadvan-

tageous to the patient. These matters were tested clinically on patients.

CLINICAL RESULTS

Observations were made on patients being subjected to oral surgery, using the "blind test" technic, essentially as described in previous reports from this institution.[6, 7, 8, 9] The solutions were prepared by one of us and supplied to the operators in the oral surgery clinic, identified only by number. The solutions were changed at frequent intervals, the same solutions being supplied under a variety of numbers, without the clinicians knowing the particular solution being used.

Each local anesthetic solution contained 2 per cent procaine hydrochloride and 1:50,000 epinephrine dissolved in either 0.48 or 0.7 per cent sodium chloride solution. To one half the solutions was added sodium bisulfite in a concentration of 0.1 per cent. Each injection was recorded by a trained worker, who has been engaged in similar studies for a number of years, and who also did not know the composition of the solutions. At the end of the study, the data were analyzed statistically according to the methods described by us previously. These consisted of determining the average responses of the various physiologic functions to the anesthetic, the standard errors of those values and the probability of their significance.

Distribution of Cases.—A total of 318 patients were studied, of whom 195 were injected with bisulfite-free solutions, and 123 with solutions containing 0.1 per cent sodium bisulfite. As shown in Table 2, most of the patients had more than one injection, inasmuch as it was frequently necessary to block more than a single nerve or region to carry out the surgical procedures indicated. Therefore, these patients received a total of 506 injections, or an average of 1.59 injections per patient. The data show that the average number of injections in each patient was virtually the same with the bisulfite-free as with the bisulfite-containing solutions.

Since the individual response is modified considerably by the site of injection, it was necessary to subdivide the cases according to the types of injections. Table 2 shows that substantially the same proportion of mandibular, tuberosity and infra-orbital injections were given with each solution, and therefore the patients in each group were quite similar. Hence, the average data for the two solutions can be compared directly, without tak-

TABLE 5.—FREQUENCY OF AFTER-EFFECTS FROM BISULFITE-CONTAINING AND BISULFITE-FREE LOCAL ANESTHETIC SOLUTIONS*

Solution	Late Pain at Injection Site	Swelling at Injection Site	Trismus	Septic Alveolus (Dry Socket)	Inflammation at Operative Site
Bisulfite-free	33.6	20.4	27.2	9.6	68.5
Standard error of percentage	±3.87	±3.32	±3.67	±2.44	±3.92
Bisulfite 0.1%	35.9	38.2	41.3	7.9	71.1
Standard error of percentage	±5.43	±5.57	±5.69	±3.09	±5.20
Probability of differences between values being due to chance	73%	0.6%	3.6%	71%	68%

*Expressed as percentages of numbers of cases in each series.

ing into account the specific types of injections used in each. Since there were only three infiltrations in the entire series, they have been disregarded in the present report.

Volume Required.—Table 3 shows that the average volume required for each patient was 5.83 cc. of the solution without bisulfite, and 5.39 cc. with bisulfite. Table 2 shows that patients receiving the bisulfite-free solutions averaged a slightly larger number of injections each. When the total volume administered to each patient was divided by the number of injections received by that patient, the average value was 3.64 cc. for each block with bisulfite-free solution as compared to 3.43 cc. of the solution containing sodium bisulfite. Thus, the average difference was only 0.21 cc., which the probability value shows is not large enough to afford any assurance that such a difference might not occur occasionally from ordinary variations between patients.

Course of Anesthesia.—The data summarized in Table 3 show that the speed of onset and duration of anesthesia, and the changes in the vital functions of heart and respiratory rates and blood pressure, were substantially the same from the two solutions. Comparison of the amount of bleeding during the operation also showed that there was no significant difference in this respect and so the vasoconstrictor power of the two solutions was substantially the same.

Frequency of Incomplete Anesthesia.—The greater number of failures to secure complete anesthesia were due to technical difficulties in injecting the solution at the proper place in or around the nerve. However, in a series as large as the 506 injections in this report, distributed equally among the various types of injections, the failures due to technical inadequacies were probably equally distributed between the two solutions. Therefore, any preponderant failure of anesthesia from one solution was in all probability due to properties inherent in the solution itself, rather than to the technic of injection. If one solution diffused into the tissues less readily than did the other, it might be expected to produce incomplete anesthesia more frequently than would a solution which penetrated readily and quickly.

Table 4 shows the average frequency of incomplete anesthesia. The bisulfite-free solution failed in only 12.7 per cent of the patients, as compared to 20 per cent for the bisulfite solution. This difference of 7.3 per cent demonstrates a marked disadvantage in the bisulfite-containing solution, and the probability value indicates this to be due to an actual difference between the solutions. Therefore, local anesthetic solutions containing sodium bisulfite are less apt to give complete anesthesia than those without this salt. This is doubtless the result of the fact that the procaine penetrates the nerves in the form of the alkaloidal base, and that the proportion of the basic form in a solution diminishes as the solution is made more acid.

Painful Injections.—The data in Table 4 show that 13.1 per cent of injections were initially painful, when bisulfite was not present, as compared with 14.1 per cent when present. However, it should be remembered that pain, which an irritant solution might cause, would be masked by the anesthetic, so that this is probably not a reliable index of the amount of actual tissue damage. Additional evidence bearing on this is presented in the data on postoperative effects discussed farther on.

Reactions.—The reactions of the patients are extremely important in judging the practical desirability of local anesthetic solutions. The reactions observed in this study were classified under perspiration, nervousness, tremor and fainting. A patient was regarded as having a fainting reaction whenever he felt suffi-

ciently faint to require temporary interruption of the operation, and lowering of the head. Almost never did this go to the point of loss of consciousness.

Perspiration, nervousness and fainting reactions were equally frequent in the two series, as shown in Table 4. However, tremors were produced much more often by the solution without bisulfite, i.e., in 20.1 per cent of the patients as compared to only 8.3 per cent in those receiving bisulfite. The reason for this is not evident, but the probability value shows that it was statistically unlikely to be a chance variation.

Postanesthetic Effects.—Since evidence of irritation from the bisulfite appeared particularly important, the after-effects of the injections, summarized in Table 5, were expected to be especially significant. Septic alveoli and inflammatory reactions at the site of the operations were equally frequent in the two series, within the limits of spontaneous variations.

Approximately one-third of the patients reported that the area injected was painful during the postoperative period, with no difference between the two solutions in this respect. However, 20 per cent had swollen injection sites after the bisulfite-free solution, as compared to 38 per cent, or almost twice as many, of those given the solution with bisulfite. In addition trismus, or muscle spasm, was observed in 27 per cent after the bisulfite-free solution, as compared to 41 per cent of those who received the solution containing bisulfite. These two observations make it evident that, although the bisulfite did not cause more pain at the time of injection or afterwards, there was an increase in the actual damage to the tissue, as shown by the increased frequency of swelling and trismus.

COMMENT

The chemical results in this study confirm those reported by us previously as to the high acidity of bisulfite-containing solutions after they have been standing for some time. Such solutions become more acid through liberation of acid as the bisulfite decomposes. The final pH level attained is dependent on the amount of bisulfite present initially and on the buffer power of procaine, epinephrine, etc. The same sequence of changes occurred when bisulfite from the usual commercial sources was used as with specially purified bisulfite. The changes are hastened by light and air, but not prevented by darkness and exclusion of air by sealing in glass ampules. Therefore, the reaction of local anesthetic solutions containing bisulfite will become more acid with time until the bisulfite is completely decomposed. The changes are the result of the inherent chemical nature of sodium bisulfite, and therefore cannot be avoided when this compound is used in such solutions.

The clinical importance of the decomposition of the sodium bisulfite lies in the fact that the breakdown products increase the irritation and tissue damage from the local anesthetics. This is indicated statistically by the increased frequency of swelling at the injection site and trismus during the postoperative period. The increased acidity may also be of some disadvantage in securing complete anesthesia, since the anesthesia is incomplete more frequently in the presence of bisulfite than in its absence.

Although these results are based on the amount of acid formed from the 0.1 per cent sodium bisulfite used in this study, it does not necessarily follow that similar differences would result from smaller amounts of acid. This has been shown previously[8] when solutions adjusted to the neutral point by the addition of buffer salts were proved not to differ materially in their clinical effects from those left at the normal acidity of the procaine hydrochloride solution. Apparently, the amount of acid present in procaine hydrochloride solutions is compatible with optimal clinical results.

While reducing the acid does not improve the clinical response, increasing it by the use of sodium bisulfite is definitely undesirable.

In a previous report,[1] it was suggested that protection of the local anesthetic and epinephrine from decomposition might not necessarily require a hydrogen-ion concentration so far beyond the physiologic range as is produced by the concentrations of sodium bisulfite commercially employed. This study confirms and amplifies these earlier suggestions that the bisulfite increases the undesirable effects on the tissues. Whether this is due solely to the acidity or partly to irritation from non-acid decomposition products could not be decided. High acidity is not indispensable for anti-oxidant power, and there is no good reason why a reducing agent might not be employed that would not require the high acidity resulting from sodium bisulfite. Procaine is adequately stable at pH values of about 5, a degree of acidity which causes no more undesirable effects than when the reaction is carefully adjusted to the physiologic normal of 7.4.[8] An anti-oxidant that would prevent the epinephrine from oxidizing at this pH value should meet the requirements of the situation, provided it did not have inherent toxic properties. These results, therefore, constitute a challenge to every manufacturer interested in producing a local anesthetic solution with maximal effectiveness and minimal tissue injury.

SUMMARY AND CONCLUSIONS

1. The sodium bisulfite used to preserve local anesthetic solutions decomposes rapidly, liberating acid end-products. As a result, such solutions become increasingly more acid with time. In the presence of local anesthetic agents, the full degree of acid production is masked by their buffer properties, but the same fundamental changes go on.

2. The effects of bisulfite-free and bisulfite-containing local anesthetic solutions were compared in 318 patients subjected to oral surgical procedures, with the "blind-test technic" previously described. The local anesthetics consisted of 2 per cent procaine hydrochloride and 1:50,000 epinephrine dissolved in either 0.48 or 0.7 per cent sodium chloride solution, with sodium bisulfite 0.1 per cent added to one half of them.

3. The presence of the bisulfite did not significantly modify the volume of solution required or the speed of onset of anesthesia or its duration.

4. The bisulfite-free solutions produced slightly greater changes in the pulse and respiratory rates and blood pressure, but the differences were too small to be of clinical significance.

5. There were 20 per cent of failures to obtain complete anesthesia with the bisulfite-containing solutions, as compared with only 12.7 per cent with the bisulfite-free solutions.

6. Painful injections were equally frequent in the two series, indicating that the local anesthetic masked any added pain from the injection which the bisulfite might have produced.

7. The amount of bleeding from the operation was not altered by the presence or absence of bisulfite. Similarly, such side-reactions as perspiration, nervousness and faintness, occurring during the operation, were equally frequent in each series; but tremors occurred more than twice as often with the bisulfite-free solution.

8. There was a markedly increased incidence of postoperative swelling at the site of the injection, and of trismus, after the use of the solutions containing bisulfite. These evidences of local tissue injury indicate the desirability of replacing sodium bisulfite as a preservative of local anesthetic solutions with some less irritant and more stable agent.

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HYPERPLASIA OF THE GUMS FOLLOWING DILANTIN THERAPY, WITH GINGIVECTOMY FOR CORRECTION

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IN 1938, Merritt and Putnam[1] reported several heretofore unused chemicals effective in protecting animals from electrically induced convulsions. One of these chemicals, sodium diphenyl hydantionate, was especially effective. In order to determine its value in inhibiting the convulsive disorders of human beings, the drug was administered to 200 patients[2] who had suffered convulsive seizures for many years and had obtained little or no benefit from the usually accepted treatments. In this series, *grand mal* attacks were completely relieved in 58 per cent and greatly decreased in frequency in 27 per cent; *petit mal* attacks were relieved in 35 per cent and greatly decreased in 49 per cent. In a small group with "psychomotor equivalent" attacks, reduction in frequency or complete relief was noted.

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Kimball[3] corroborated the value of sodium diphenyl hydantoinate (dilantin) after observing its effect in relieving seizures in 62 per cent of 152 epileptic patients. He emphasized the improvement in general health and the mental state and personality of the patients. He called attention, however, to the fact that certain undesirable and even serious side effects had been observed subsequently to dilantin administration. Particular observation was made of a phenomenon involving the gums.

The toxic manifestations associated with the use of dilantin are vertigo, ataxia, tremor, blurring of the vision, diplopia and slight nausea. In the early weeks of treatment, dizziness and "unsteadiness" are common, but these symptoms tend to subside in the course of time. Cutaneous reactions of a morbilliform or scarlatinal nature have been observed. In most instances, these rashes

are accompanied by fever. Both conditions tend to disappear in a few days with discontinuance of the medicine. Putnam and Merritt observed two serious reactions, one an exfoliative dermatitis and the other a non-thrombocytopenic purpura, both of which cleared up when the drug was discontinued.

It has been noted in some patients that dilantin causes the gums to become swollen and tender. The condition may vary from the presence of a smooth firm area of hyperplasia which does not bleed and is not particularly tender, to an advanced hyperplasia with soreness, bleeding and gingivitis. This reaction, which is apparently independent of the amount of the drug taken or the duration of treatment, has been observed in both children and adults. Attention was directed to this reaction first by Kimball, who attributed

Fig. 1.—Hyperplasia of gums. The upper gums showed similar changes.

it to a reduction in the ascorbic acid content of the blood serum. The usual symptoms of vitamin C deficiency (scurvy), such as purpura, sore joints and extreme weakness, were not seen in these patients. Kimball had not noted the reaction in any patient with good oral hygiene. Later, Putnam[4] observed similar cases, but was disinclined to believe that the hyperplasia of the gums was a manifestation of scurvy. While it was acknowledged that this phenomenon caused the patient no great inconvenience, neither author has discussed the success of any treatment for the hyperplasia, nor have they stated whether the gums of such patients have again become normal.

We have had an opportunity to observe two cases of hyperplasia of the gums following dilantin therapy: one case, the mild type, occurring in a 4-year-old boy; the other, a severe case, with extensive hyperplasia, gingivitis, petechial hemorrhages on pressure and considerable associated soreness. The latter was of special interest to us because of its failure to respond to a variety of local treatments. After two months, gingivectomy was performed by one of us (E.C.T.) as a means of eliminating the hypertrophic gum tissue. To our knowledge, this type of gingival plastic operation has not been undertaken for the correction of dilantin hypertrophic gingivitis. Since there is apparently no spontaneous restitution of the gums to normal for a long period, if at all, such

Fig. 2.—Normal appearance of gums approximately one month after last stage of gingivectomy.

procedures may be indicated in certain cases of marked gum hyperplasia following dilantin therapy.

REPORT OF CASE

R. M., a white girl, aged 14 years, first seen at the clinic February 11, 1938, was born in the Illinois State Hospital for the insane. Little was known of her birth. Her father had been an inmate of the State Penitentiary. Her mother had epilepsy. There were three other living children in the family, but none of them had epilepsy. Generalized convulsive seizures had begun in 1936 and later attacks of *petit mal* had occurred. The convulsions occurred as frequently as three times daily. For a year or

more, the patient had been given phenobarbital, without apparent alleviation of the severity or the frequency of the attacks. She was a dull, listless, undernourished girl. The physical examination was essentially negative.

The urinalysis and complete blood count were normal. The blood Kahn and Rytz tests were negative. The fasting blood sugar was 100 mg. Roentgen studies of the chest and skull were negative and the fundi were negative.

Phenobarbital was prescribed, later supplemented by bromides. There was only slight improvement in the frequency and severity of the *petit mal* and *grand mal* seizures. In April 1939, dilantin therapy was started, with gradual withdrawal of the phenobarbital. One and one-half grains of dilantin was given three times daily and, in the succeeding fifteen months, only four *grand mal* seizures occurred. The *petit mal* attacks were infrequent and there was marked improvement in the mental state and personality. In June 1940, the gums became swollen and bled easily. However, the patient did not return to see us until September 1940. At that time, the gums were markedly hyperplastic and spongy and bled easily and there was associated gingivitis (Fig. 1). Smears of the gums at that time showed *Bacillus fusiformis* and *Spirochaeta denticola*. The dilantin was discontinued. One hundred milligrams of cevitamic acid daily and a high vitamin diet were prescribed. Unfortunately, it was not possible to make ascorbic acid determinations on the blood or urine. Clinically, there was no evidence of scurvy and there was complete lack of response to treatment with cevitamic acid. Since discontinuation of the dilantin, there has been only one convulsive seizure in six months.

The patient was first seen in the dental department in September 1940. The initial local treatment consisted of the application of chromic acid (7 per cent) and mouth washes of hydrogen peroxide (50 per cent in water). Three treatments with the x-rays were given to the gums, each being 120 r units at 100 KV filtered with 1 mm. of aluminum. There was slight improvement in the soreness, but no change in the hyperplasia. Since no improvement occurred, gingivectomy was performed on both jaws. This was accomplished in four separate sessions, the first being on November 8, 1940. Large amounts of gum tissue were removed and a dressing of obtundent cement was applied each time. Although the gingivectomy involved removal of large amounts of hypertrophic tissue, the patient complained of little postoperative pain and made an uneventful recovery each time (Fig. 2). The pathologist's report on various biopsy sections was chronic inflammatory tissue.

CONCLUSION

It is not unlikely that poor oral hygiene is a factor in gum hyperplasia from dilantin therapy. In both cases, the patients were in poor circumstances and quite inattentive to mouth hygiene. It would perhaps be wise when dilantin is to be administered to advise thorough scaling and polishing of the teeth prior to or at the time the drug is started. There is great variance in the time of appearance of gum hyperplasia with dilantin therapy. In one of our cases, it occurred six weeks and in the other fifteen months after the medication was started. Consequently, we believe that patients undergoing treatment for epilepsy with dilantin should be observed closely throughout the period of administration. Gingivectomy in certain cases offers a practical and satisfactory method of restoring the appearance of the gums when other treatment is ineffectual.

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INCREASING THE POSSIBLE DENTURE FOUNDATION AREA BY SURGICAL MEANS

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WHEN I was at Denver University and at the University of Pennsylvania, I was taught that the alveolar process is a specialized bone which normally is resorbed and disappears after extraction of the teeth. And for years I told my patients that we removed with alveolectomy that bone only which Nature would remove in the course of time. I hope college professors are not still teaching this fallacy.

I confess that perhaps I do not know histology and perhaps the bone in an edentulous mouth is not alveolar bone but just jaw bone, but whatever kind of bone it is, I do know that it is infinitely better than no bone for the support of a denture, and I do know, from careful observation of dozens of cases, that it is not necessary or advisable to remove or destroy bone that Nature put in the mouth for the support of teeth, just because Nature would or might remove it through disuse atrophy if the patients were obliged to go edentulous for months or years.

The advent of the immediate denture has changed all this. It is no longer necessary for people to lose Nature's normal tooth support by disuse atrophy. And if we will change our idea that alveolectomy is the thing, the alveolar process can be permitted to function ideally and serve as denture support indefinitely. Since we have discontinued alveolectomy, and by this term I mean the removal of any cortical plate or alveolar bone, we see many edentulous mouths with thick well-rounded ridges wherein resorption has been practically nil since the removal of teeth. And here I wish to make a plea for conservation of alveolar bone, for I am convinced that rongeurs and chisels, as used by nearly all exodontists and by many prosthodontists and general practitioners, are a menace. The extractionists will invariably tell you that they are conservative in their procedures, that they "trim away only enough bone to eliminate all undercuts." Why do they think that they should eliminate all undercuts? What harm do undercuts do? I believe that the broader the base for a denture, regardless of undercuts, the better the results.

During the last six or eight years, I have studied the work of probably fifteen or twenty operators in clinics, motion pictures and published articles, showing their procedure in preparing mouths for immediate denture service, and, in my opinion, in every instance too much bone was removed either before or after extraction of the teeth. A film that Merrill G. Swenson, of New York University, presented to the Colorado State Dental Association last June showed the most conservative removal of bone of all observed to date and I was pleased by Dr. Swenson's statement, as the film was being run, that the surgeon was removing more bone than he (Swenson) wished to have removed. It makes me feel ill to watch the usual cutting away of the entire cortical plate over one-third to

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two-thirds of the length of the roots, followed by cutting away of the gum tissue with shears; removing at least all of the interproximal gum tissue; leaving two straight lines of gum, which are drawn into close apposition with tightly drawn sutures, and often shortening or lowering the peripheral tissue, when a better service could have been rendered the patient in most instances by removing no bone and no gum tissue and, if anything, raising or extending the peripheral tissue attachments instead of shortening them.

In the rare cases of an objectionably prominent gum with the natural teeth, it is desirable to reduce the alveolar ridge for esthetic reasons. But, even in these cases, it is sometimes best to conserve the labial plate and insert the porcelain teeth in the sockets, thus permitting patients to continue to display their own gums.

Abnormal and unsightly enlargements, e.g., torus labialis or torus buccalis, covered by exceedingly thin, unyielding gum tissue should of course be surgically removed. We should almost never remove any normal buccal plate over bicuspids and molars unless this is necessary to extract teeth or roots. And we should not remove the entire plate, but only a narrow channel directly over the root being extracted, leaving a wall of well-nourished bone on each side of the channel to act as a matrix for the channel to be filled in with new bone. If, after the sockets are all filled in with normal bone, the tuberosities are so prominent that the cheek muscles contact them closely when the mouth is open or the mandible protruded, the condition precluding the possibility of enclosing them with the heels of the denture, and if sufficient stability cannot be procured without enclosing the tuberosities, we are then and then only justified in operating to alter the buccal contour of such a tuberosity. Otherwise, buccal and labial areas with undercuts above them can be disregarded and the denture periphery can be extended to contact the movable tissue above the undercuts, with an edge thick enough not to cut or bruise the

Fig. 1.—Anterior portion of lower jaw which stands up well for support of lower denture. The posterior teeth had been missing for many years and extensive resorption had occurred. The six anterior teeth had a ridge of heavy dense alveolar bone just below the necks of the teeth extending about one-third of the distance toward the apices of the teeth. Toward the apical two-thirds of the roots, the bone covering them was very thin. The Boley gage measurement from lingual to labial aspect was only 5 mm. just above the apices of the incisors, but it was 10 mm. just below the necks of the teeth. An alveolectomy on the prominent portion of alveolar process below the necks of the teeth to eliminate the undercut below would have resulted in a sharp ridge that would absorb very rapidly until shortly, in all probability, the mouth would be as flat across the front as it was already on both sides at the back. Therefore, no bone whatever was removed with the teeth, but instead this undercut on the cast was filled in and thus made a denture that was greatly oversize in this undercut area. At the time of extraction of the teeth and insertion of the immediate denture, a generous flap of gum and periosteum was laid back, and the labial cortical plate in this undercut area scarified just enough to draw some blood and promote bone-cell repair activity. The gum flap was supported with loose sutures permitting blood to fill in the entire undercut area. At this time, the oversize immediate denture was inserted. The gum carrying the periosteum adapted itself to the inner surface of the denture. The blood clot filling the space between the scarified bone surface and its periosteum acted as a matrix for the filling in of this space first with granulation tissue and later with substantial bone for the support of a denture.

tissue after the denture has been cut out sufficiently to pass over the prominence, leaving an unoccupied space in the undercut. The same result can be obtained perhaps better by filling the undercut on the wet cast with hydrocal before waxing. The fact that peripheral seal against soft movable tissue is the principal factor in retention was graphically brought to my attention fifteen years ago, when M. M. House demonstrated before the National Society of Denture Prosthetists the extreme suction obtainable by means of an oversize impression tray with peripheral adaptation with compound and no bearing whatever on the ridge or hard palate areas.

Some of the foregoing statements may sound strong or perhaps even too good

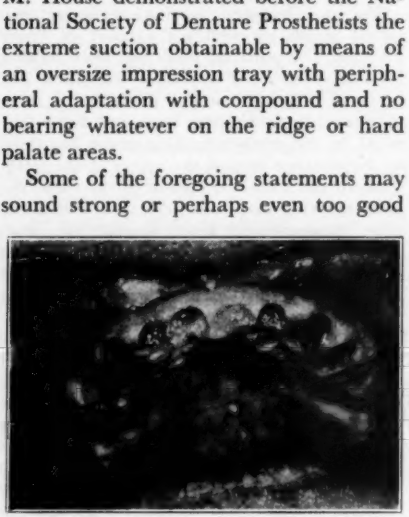

Fig. 2.—Usual, sufficient mouth preparation for insertion of immediate denture, after simple extraction, with curettage of sockets if necessary to remove granulomatous tissue.

to be true, but I wish to assure you that we can not only conserve nearly all of the bone present in a mouth before extraction, but can actually, in selected cases, with Nature's assistance, build new bone in deficient areas.

I have in mind particularly lower cases in which the jaw is very thin linguolabially toward the apices of the lower incisors. In some of these cases, the linguolabial diameter is considerably greater just below the necks of the teeth; which results in a decided undercut in the thin area below. Our procedure in such a case is to wet the stone cast and fill this undercut with freshly mixed hydrocal, shaped as we should like to have it if we could call on Nature to build to our pattern. When we have thus built onto the cast with the idea of encouraging bone growth in a deficient area and the denture is finished, and before its insertion, a gum flap and the periosteum are laid back, the bone being bared over an area somewhat larger than the area we have laid out upon the cast. The cortical plate is scratched or scarified just enough to draw a little blood and to encourage bone repair activity. The gum flap is laid back to place and sutured loosely with the idea that the gum will conform to the enlarged inner surface of the denture. The space be-

Fig. 3.—Simple extraction for immediate denture with no bone removed. The low labial frenum and buccal cords have been snipped with gum shears. No section of cord need be removed and no sutures are used. The denture is simply inserted and left in place while healing takes place.

tween the gum and the bone will be filled with a blood clot, which will later be replaced with bone or gum tissue or both. In any case, a broader, more satisfactory base for a denture is provided.

The other type of case in which we have used this procedure with gratification is in shrunken areas, resulting from removal of an impacted tooth, an abscess or a cyst. I claim no priority for this idea, as I know that a number of dentists in different parts of the country

have been doing this for a great many years; but I am convinced that too few are giving their patients all of the benefits that can be conferred by this type of procedure.

Nearly all full denture cases in which all of the teeth have not yet been extracted should be handled as immediate denture cases.

Our usual procedure with an immediate denture is to extract all posterior teeth first, but not long enough before removal of the anterior teeth to permit disuse atrophy to occur; leaving just the six or eight anterior teeth for removal at the time of the insertion of the denture. I am convinced that, from a practical standpoint, three months is too long for a patient to go without any of his teeth if we are to provide the ideal in ridge efficiency, as well as for the sake of maintaining the normalcy of the mandibular joint ensemble. As a matter of fact, three weeks may be too long. I have been well pleased with the way anterior ridges conform to immediate dentures, and I am beginning to think that, from the standpoint of the ultimate ridge foundation alone, it might be best if all of the teeth to be removed in preparation for an immediate denture were extracted at the time of insertion of the denture. Nature is constantly trying to conform to conditions as she finds them, and she has a better chance to fill in the sockets of the extracted teeth and transform the specialized alveolar process into the type of bone best fitted to support a denture if all of the teeth have been extracted at the time that the denture is inserted.

Hugh W. MacMillan, in a paper read before the American Dental Association in 1927, quotes Gray and Carr's report of experimentation on bone repair in the dog. They drilled a hole 4 or 5 mm. in diameter in a similar position in each radius. The right foreleg was immobilized, the left remained in use. Two weeks later, on x-ray examination, the right leg injury showed no change, while the left leg showed osteogenesis, and subsequent examinations revealed considerably slower progress in healing in the immobilized leg. He concludes with the logical statement that "the repair of surgical injuries of the jaw is as dependent on functional stimuli as is the

Fig. 4.—Immediate denture just placed in mouth; thinness of labial plate shown in dark area where blood shows through acrylic labial plate.

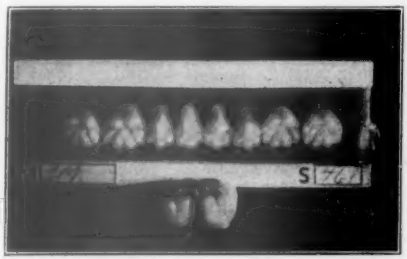

Fig. 5.—Lower teeth, normal-sized, with flattened occlusal surfaces ground or baked to conform to the curvature of 8-inch sphere; upper, normal-sized teeth with the buccal cusps out of occlusion. The lingual aspect of the teeth presents a series of knife-edged chopping blades shaped to conform in occlusal contact to the flattened curvature of the lower teeth. The teeth are set to conform to the normal excursion of the individual jaw with the upper chopping blades contacting the lower food table in all functioning closure positions. With this tooth contour and arrangement, patients are provided with maximum masticating efficiency with minimum trauma of the supporting tissues.

successful healing of injuries in the experimental animals."

We may have, in addition to necrosis or atrophy from infection, atrophy from lack of use or function; atrophy from trauma or interference with the circulation from constant or continued pressure, and nutritional deficiency atrophy. We should advise our patients as to what foods they should eat to provide the mineral and activator elements to build and maintain normal bone. We should provide dentures so constructed that they will exert a physiologic stimulating, intermittent pressure, promoting the circulation and the vigor and health of the underlying structures, both gum and bone, and avoiding pressures causing atrophy or excessive shrinkage.

Fig. 6.—Upper jaw with flabby ridge and low, strong tendinous cords that persisted in dislodging dentures.

Fig. 7.—Upper jaw (Fig. 6) with gum tissue carrying periosteum laid back.

When an immediate denture is indicated, and before the teeth are extracted, a good hydrocolloid impression is made, extending well up around the entire periphery and supported so as to provide a close adaptation across the postdam area in the palate and over the edentulous ridges and up onto the stress-bearing area of the hard palate. This is accomplished by building up a hydrocolloid tray across the palate and over the edentulous posterior ridges with carefully adapted modeling compound. Generous relief or a wide open space is provided over all three palatal foramina and over the rugae and the hard median palatal area.

The surface of this compound is heated to a soft flowing state, when the hydrocolloid, which has previously been boiled and then cooled to correct temperature, is inserted in the tray and seated gently in the mouth. It is undesirable to have the compound cut through, displacing movable tissue. As the cooling process is started, I have patients inflate the lungs and hold their breath for ten or twelve seconds to retard the return flow of blood through the lungs. Thus, we make an impression with the blood vessels of the palate enlarged or expanded, to provide physiologic relief over the larger blood vessels and the nerves that parallel the principal blood vessels in the palate. We do this also with our full denture impressions with compound and plaster. Robert I. Wood, of Sturgis, S. D., gave me this idea several years ago.

A good stone cast is poured in this impression, of which a duplicate is made in plaster. These duplicate casts are of value in checking the set-up after the teeth have been removed from the stone cast and the porcelain teeth substituted for them. They are also valuable as a permanent record of the appearance of the patient's teeth before their removal. A bite-plate is next made of hard base-plate wax, reinforced with two or more pieces of galvanized iron wire or common baling wire. The correct jaw relations are next established and the tooth selec-

tion is made. The case is now mounted on the articulator and the posterior teeth are set up and tried in for occlusion and jaw relation. Next, the anterior teeth are set up, in the patient's presence. The depth of the free margin of the gum is tested on each tooth as we proceed with the removal of one tooth at a time from the cast, with the placing of its artificial substitute in its exact position; removing each tooth from the case as nearly as possible to the depth of the free margin of the gum in the mouth. This distance is approximately the amount that the gums will collapse after the removal of the teeth without surgical removal of bone.

After all of the teeth have been ground at the necks to conform to the shallow sockets prepared as above; after each tooth has been ground, shaped and fitted to duplicate its corresponding natural tooth as accurately as is desirable, and after all the teeth are firmly set in wax to our satisfaction and the patient's, the wax baseplate is removed from the cast and the cast material which remains standing labially from the necks of the porcelain teeth (and which corresponds to the unsupported free margin of gum, which will collapse upon the removal of the teeth) is carefully pared off with a knife, a smooth well-rounded cast remaining. The wax denture is now returned to the cast and the labial portion is covered with wax, with particular care to provide the exact thickness that will normally be removed in the polishing process, plus the thickness of cast material that was pared off to provide for the collapse of soft tissue, gaged by the depth of the free margin of the gum. If necessary to avoid overcontouring of the lip, the new resin bases can be finished to almost paper thinness. All cases should, however, be waxed somewhat thicker at the periphery, for, as stated above, all peripheral margins must be thick enough that there will be no cutting edge to irritate the movable peripheral tissue.

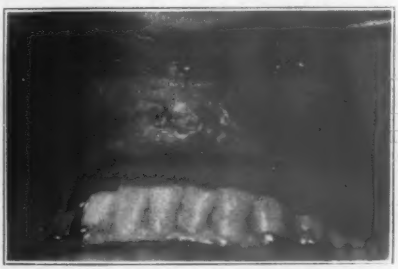

Fig. 8.—Upper part of mouth shown in Figure 6, three weeks after operation; indicating how much tissue attachments were raised and areas where new granulation tissue is filling in. In this case, the denture was placed without the loose sutures on the assumption that the denture would place and hold the gum flap in its correct position. But, on the patient's left side, the flap was puckered, requiring a much larger area to be filled in with new tissue than was the case on the right side. This error caused the patient several days' additional discomfort on this side; but the condition is satisfactory now, showing how much Nature helps in these cases.

Fig. 9.—Lower jaw with knife-edged bone in the ridge area and high tendon or muscle attachments from second bicuspid to second bicuspid.

The teeth are now extracted, with all possible care to avoid fracturing the process. (Figs. 2, 3 and 4.) The denture is inserted, the occlusion is checked and the patient is dismissed; always with an appointment for the next day for checking and adjusting.

It is remarkable how Nature will build

to a pattern in these immediate denture cases. We have had a number of cases in which, in spite of the greatest of care in extracting, a section of fractured labial plate has adhered to a cuspid root and has been removed, and still the mouth has healed, with a full rounded ridge in this area; which I am convinced it would have been much less apt to do had the patient gone edentulous for a number of weeks or months.

A year ago, I finished checking all of our immediate denture cases that I was able to get in touch with, to ascertain as far as possible just how these cases are standing up in service, how long they are being worn before rebasing or remaking, how many need refitting and are not getting it and how many are continuing to give satisfactory service after a year or more without refitting.

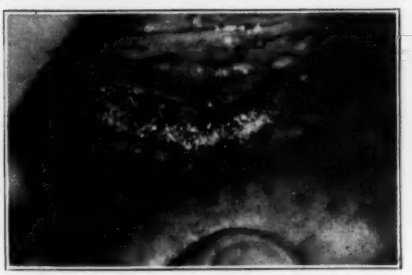

Fig. 10.—Lower jaw (Fig. 9) with tissue plus periosteum detached from bone.

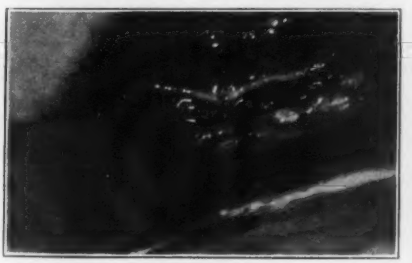

Fig. 11.—Lower jaw with loose sutures to prevent prepared denture from carrying loose gum flap too far back.

We called in and checked or checked from the records on our books forty-eight of these immediate denture cases. We found the average length of time that these cases were worn without refitting to be one year, five months and twenty-three days. The time varied from a minimum of two months to a maximum of five years and three months. The latter case still fitted very well at the time of refitting and the patient would have still been wearing the original dentures except for the discolored and checked condition of the cellulose base material originally used.

Eight of these cases still fitted very satisfactorily and were still being worn. The average length of time that these eight dentures had been worn was two years, one month and fourteen days. We were of course unable to get in touch with all of our immediate denture patients and it is problematical whether these unchecked cases would have raised or lowered this average. I am inclined to think that they would be more apt to raise it than to lower it on the basis that those who are having trouble are more apt to come back of their own accord than those who are comfortable and happy.

If the foregoing is as good a record of service for immediate dentures as I think it is, no doubt the favorable results may not be entirely due to the conservation of cortical plate, but partly to the elimination of lateral trauma and excessive occlusal pressure by the design and set-up of posterior teeth that I have been using. (Fig. 5.)

Last but not least, I shall submit to you my solution of one of the most baffling problems that we have been faced with in denture prosthesis: what to do about the tendinous tissue or muscle attachments that loosen dentures because of being attached too close to the crest of the ridge or that part of a resorbed

jaw where the ridge should be. (Figs. 6 and 7.)

To accomplish this object in an edentulous mouth, a deep incision is made on the crest of the ridge or in the approximate center of this area if no ridge is present. This incision is extended somewhat farther than the last muscle attachment that needs correcting. All muscle or fibrous tissue is detached from the bone, with a generous flap laid back labially, buccally and lingually, and the bone bared over a somewhat broader area than the surface that it would seem desirable to have covered by the denture. (Figs. 8 and 9.) Two or three loose sutures are placed, each suture being tied over the handle of an instrument to provide enough slack that, in the insertion of a denture which has been made to extend the attachments, the latter will be extended the right amount, but will not be extended too far, folded under or puckered up undesirably. (Fig. 11.)

The next step is the insertion of the new denture that has previously been made, with the correct extension of outline and with the periphery quite thick, well rounded and highly polished. The extension that I usually accept as correct in such a case is the maximum obtainable by carrying softened compound as high on an upper jaw and as low on a lower as is possible with the lip muscles completely relaxed. I try to obtain these extended borders without impingement upon or too close contact with the jaw, as there should be enough space in the finished denture to provide room for a normally heavy gum cushion over the bone after complete healing has taken place.

It is important, as in the case of an immediate denture, that the denture be kept in place continuously for at least twenty-four hours, to confine the blood clot and fix the severed muscles in their extended position. It can thereafter be taken out daily or several times a day for a few minutes at a time, for cleansing and bathing the mouth with any good aseptic solution, such as surgical solution of chlorinated soda or physiologic sodium chloride solution. (Figs. 11, 12 and 13.)

In some cases, we simply clip narrow tendinous cords close to the ridge at the time of the insertion of a denture that has previously been made with borders thus extended and instruct the patient to wear the denture continuously until the wounds heal. In either case, the patient is liable to be uncomfortable and unhappy for from a few days to a few weeks, but the ultimate results seem to justify the procedure.

Fig. 12.—Lower jaw (Figs. 9, 10, 11) three weeks after operation.

Fig. 13.—Mouth shown in Figure 12 six weeks after operation.

The photography illustrating this paper is by Lyndon Carmen and Max Giesecke. The surgery is the work of William L. Earley, exodontist in our group.

1206 Republic Building.

DENTIGEROUS DERMOID CYST OF THE OVARY CONTAINING A PORTION OF A MANDIBLE

By David F. Heron, D.D.S., Detroit, Mich.

DERMOID cysts containing teeth have frequently been reported in the medical and dental literature. The one reported here is, I believe, unusual in that it contained a well-formed portion of a mandible with several teeth erupting in their proper positions, as well as an underdeveloped portion of the ascending ramus.

REPORT OF CASE

Mrs. C. M., aged 32, six months pregnant, came to the hospital December 18, 1940, because of upper abdominal pain of two months' duration. A hard, irregular mass could be palpated to the left of the midline in the upper abdominal quadrant. A left retrograde pyelogram revealed a calcified area, 2 inches by ½ inch, in the region of the left kidney, and roentgenographic examination showed this to be a dermoid cyst of the left ovary. As a tumor was interfering with the progress of the pregnancy, an abdominal operation was performed on December 20, by Ira G. Downer, to remove the growth, which proved to be a thin-walled ovoid cyst, measuring 11 cm. and 8.5 cm. in maximum diameter and weighing 285 gm.

The cyst contained hair and sebaceous material and, attached to its inner surface, a piece of bone, approximately 7 cm. in length, having the shape and contour of one side of a mandible, as shown in the illustration. Attached to this bone was a spongy mass, 3.5 cm. in diameter, containing hair. In proper position at the symphysis of the mandible were two normally shaped and fully erupted central incisors. Adjacent to the incisors and also in normal position was a partially erupted cuspid. At the opposite end of the jawbone was an ascending bony structure representing a rudimentary ramus. Here, another tooth was found loosely implanted in a socket. Two well-developed molar teeth were also loosely attached to the posterior aspect of the mandible, and one of them was further attached to the inner lining of the cyst.

Dermoid cysts constitute about 10 per cent of all ovarian tumors, and, according to Ewing,[1] approximately half their number contain teeth and rudiments of bone. Of ninety-one dermoid cysts observed in seventy-nine patients by Glass and Rosenthal,[2] hair and sebaceous material were found in eighty-one; teeth in eighteen, bones in thirteen and teeth and bones in eight. Some observers believe that embryonic tooth follicles are present in all dermoid cysts. An interesting observation is that deciduous teeth tend to develop in cyst walls, while permanent teeth develop in an osseous matrix. Dermoid cysts containing from one to several hundred rudimentary teeth have been reported. These teeth may be found firmly implanted in sockets of rudimentary maxillae, lying free in the cyst cavity or more often embedded in the cyst wall. The teeth found have usually been incisors or molars. Occasionally, a very rudimentary mandible with the coronoid process is seen.

To be classed as a dermoid cyst, a cystic tumor must contain elements found in the dermis, such as sweat and sebaceous glands, hair, nails or epidermal tissue. Dermoid cysts may be found in various parts of the body. They have

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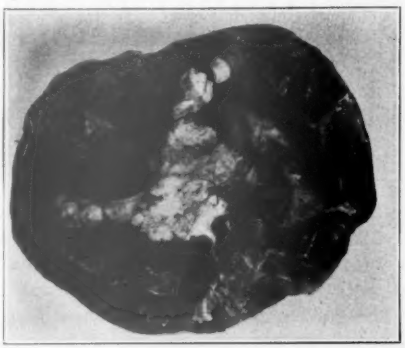
been found inside the skull and about the neck and postanal region, but have a predilection for the ovary. Those occurring in the ovary often have a tendency to perforate adjacent viscera. In one instance in which an ovarian dermoid cyst perforated the urinary bladder, teeth were removed from the bladder.[3] Single, well-formed teeth have occasionally been found in dermoid cysts of the pelvic region.

Microscopically, most of the tissues found in a dermoid cyst are adult in type, although deciduous teeth and tooth follicles have been reported. Hair, usually of a different color from that of the scalp hair of the patient, sebaceous material, sweat glands of the skin, portions of salivary glands, thyroid tissue, bone and cartilage are frequently found. Portions of digits, intestine, brain, eyes, nerve ganglia, bone, bronchi and muscle have also been identified. Almost every known structure has been found within these dermoid cysts except the reproductive glands.

These neoplasms completely involve the structures of the ovary or leave remnants of the gland on one side of the tumor. The capsule is usually thin, grayish or whitish and well-vascularized, and, in one portion of the wall, there is almost invariably a thickened area or "head" from which spring bundles of hair. Under its epithelial covering may be found the various tissues of a mature type which make up the characteristic constituents of the dermoid cyst. These tumors are a cystic form and represent a one-sided development of teratoma. In contradistinction to most teratomas of the ovary, the dermoid cyst is benign.

There is still no unanimity of opinion as to the histogenesis of dermoid cysts. They are held to be congenital and have often been found in young children, but are usually discovered during the reproductive years. They are usually singular, but may be bilateral and multiple. They vary in size, seldom exceeding the size of a cocoanut. Some authorities contend that the dermoid cyst should be considered a twin, belonging to the same generation as the patient in whose ovary it develops. Wood[4] points out logically that such a tumor must arise from a cell which is totipotent; that is, contains within itself the capacity of almost all types of tissue. This means that the cell must have been left in the ovary or formed in it at an early stage of development.

There are three principal theories explaining these tumors: The older and now abandoned theory was that polar bodies, after they are set free, are



Dermoid cyst of left ovary containing hair, fatty material, teeth and bone representing one-half of a well-formed mandible and underdeveloped ascending ramus.

capable of further development. Another view, still held by some, is that unused blastomeres of high potency are left in the ovary during the course of its formation. If, for some reason, the normal development of the primary blastoderm is interfered with, each blastomere may give rise to a small embryo or complex dermoid cyst. The present view, concurred in by both Ewing and Wood, is that these complex tumors and the solid teratomata of the ovary are derived from ova which undergo parthenogenetic

stimulus to development, and, as a result of that development, form a rudimentary fetus. This is referred to by Ewing as "spontaneous growth of the unfertilized ovum." As has been pointed out, ovarian dermoid cysts containing embryonic structures should occasion no surprise since the ovary is in reality an embryo factory, and, given the necessary stimulus, certain elements will start growing. Until more is learned concerning these embryomata, however, any discussion of their origin must of necessity be purely speculative.

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SECONDARY DENTIN FORMATION IN THE DECIDUOUS TEETH

By RALPH L. IRELAND, B.S., D.D.S., Lincoln, Nebr.

IT has been a matter of conjecture as to whether the deciduous teeth possess the ability to form secondary dentin in response to various external stimuli. Noyes, Schour and Noyes say, "The formation of secondary dentin in response to abrasion or caries, the ease with which the deciduous teeth abrade, and their high incidence of caries, present problems necessitating further research."[1]

Churchill, in his book "Human Odontography and Histology" says, "The pulp tissue of the deciduous teeth does not, as a rule, react with the formation of adventitious dentin to external stimuli. Persisting elements may constitute an exception."[2] Adventitious dentin is the term used by Churchill instead of secondary dentin.

Bunting and Hill say, "Deciduous teeth also seem to be almost wholly lacking in the ability to form secondary dentin in response to injury. In them, it would appear that the physiologic tendency is toward resorption of dentin under stimulation rather than the building of new structures."[3]

In the permanent teeth, secondary dentin is formed in response to various stimuli, such as caries, abrasion, operative procedures and chemical and thermal irritation. When the irritation is excessive, secondary dentin is formed much more rapidly and is more irregular in structure. If the irritation is mild, secondary dentin is deposited more slowly and its structure more closely resembles that of primary dentin. In sound permanent teeth, secondary dentin is also formed intermittently throughout the life of the teeth. The theory is also

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offered that different individuals as well as different teeth vary in their ability to form secondary dentin in response to different stimuli.

For the past four years, I have been studying the problem of deep carious areas in the deciduous teeth.[4] Three hundred cases have now been treated by removing all of the soft carious dentin,

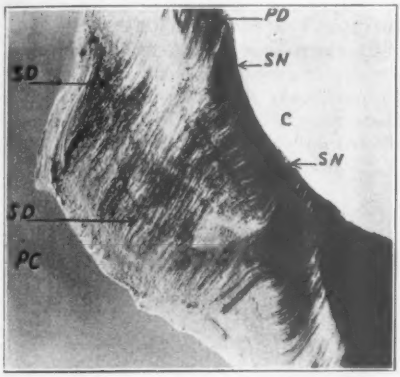

Fig. 1.—Ground section of deciduous maxillary central incisor. C, cavity. PC, pulp chamber. SD, secondary dentin. SN, silver nitrate penetration. PD, primary dentin. (×45.)

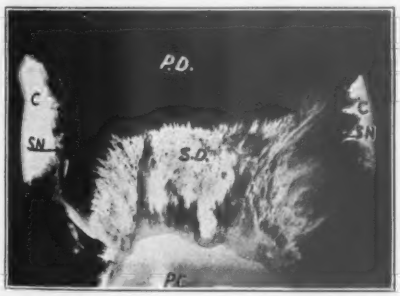

Fig. 2.—Ground section of deciduous maxillary central incisor. C, cavity. SN, silver nitrate. PD, primary dentin. SD, secondary dentin. PC, pulp chamber. (×50.)

leaving undisturbed the somewhat harder discolored dentin, which had become infected in advance of the primary area of decay. This remaining discolored dentin was treated with ammoniacal silver nitrate and eugenol. A cement base was placed over the dentin treated with silver nitrate and a silver amalgam restoration was inserted. Following this treatment the cases were observed at frequent

Fig. 3.—Ground section of deciduous maxillary central incisor. C, cavity. SN, silver nitrate. PD, primary dentin. SD, secondary dentin. PD, pulp chamber. (×50.)

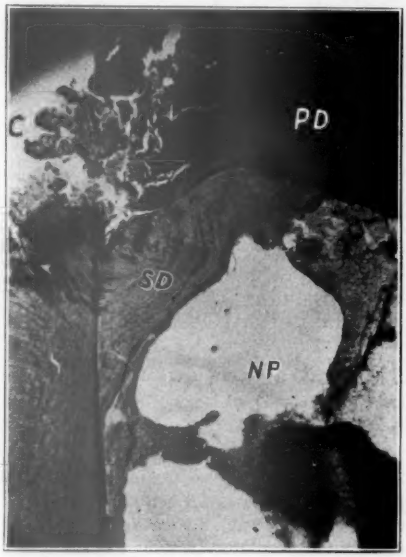

Fig. 4.—Decalcified section of deciduous maxillary central incisor. C, cavity. PD, primary dentin. SD, secondary dentin. NP, necrotic pulp. (×36.)

intervals. During this study, it was noted that the pulps of the deciduous

teeth exhibited great recuperative power, and ground as well as decalcified sections made from teeth treated by the foregoing method have been the source of much of our material for this study.

REPORT OF CASES

CASE 1.—The deciduous right and left maxillary central incisors, in which there were deep carious areas, were treated by removing all of the soft carious dentin and applying ammoniacal silver nitrate and eugenol to the remaining harder, but discolored dentin. A cement filling was placed in the cavity of the right central incisor

Fig. 5.—Decalcified section of deciduous maxillary central incisor. C, cavity. PD, primary dentin. SD, secondary dentin. P, pulp. (×36.)

immediately after this treatment and was maintained in the cavity until the tooth was extracted, one year later. At the time of extraction, the tooth was vital and the roentgenogram revealed no infection. The photomicrograph of the ground section of this tooth shows the quantity and quality of the secondary dentin which was formed, and reveals what might be a dividing line between the secondary dentin deposited in response to the stimulation of caries and that which was formed after the application of the ammoniacal silver nitrate and eugenol. (Fig. 1.) If this assumption is correct, the amount of secondary dentin deposited in each instance is about the same.

CASE 2.—The deciduous maxillary right and left central incisors were treated in the manner described in the previous case; i.e., all soft carious dentin was removed and the remaining harder discolored dentin was treated with ammoniacal silver nitrate and eugenol. The cavities in these teeth, however, which were on the mesial and distal surfaces of each tooth, were left open after treatment. At the time of extraction, the teeth were vital and the roentgenograms showed no infection. The photomicrographs of the ground sections of these teeth show the

Fig. 6.—Ground section of deciduous molar. C, cavity. SN, silver nitrate. PD, primary dentin. SD, secondary dentin. (×50.)

quantity and quality of the secondary dentin. (Figs. 2 and 3.) Owing to the presence of a larger area of exposed primary dentin, more secondary dentin was formed in these teeth than in the preceding case.

CASE 3.—Figures 4 and 5 are photomicrographs of decalcified sections of the deciduous maxillary right and left central incisors. The cavities in these teeth were deep. They were treated November 8, 1938, in the manner described in the preceding cases. No fillings were placed in the cavities after treatment. In December 1939, as the result of a blow, the pulp in the right central incisor became necrotic, probably owing to a hematogenous infection, and the tooth was

extracted. The section of this tooth (Fig. 4) shows the quantity of secondary dentin which had been formed prior to the time of the accident. It is noted that the secondary dentin formed a bridge across the area opposite the base of the cavity in order to protect the pulp. In all probability, had the tooth not received the blow, it would have remained in the arch in a vital condition for its allotted time.

The left central incisor was not affected by

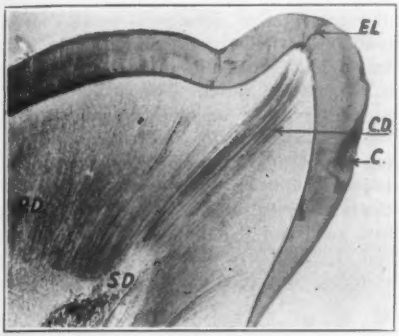

Fig. 7.—Section shown in Figure 6. C, cavity. PD, primary dentin. SD, secondary dentin. EL, enamel lamella. CD, clogged dentinal tubules. (×36.)

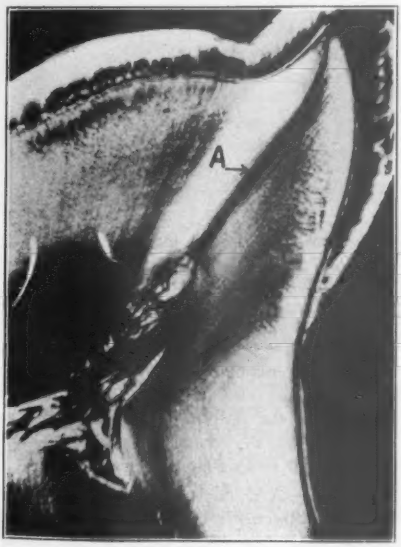

Fig. 8.—Photomicrograph taken through polarized light of portion of section shown in Figure 7. A, clogged dentinal tubules through which stimulation was transmitted to pulp. (×36.)

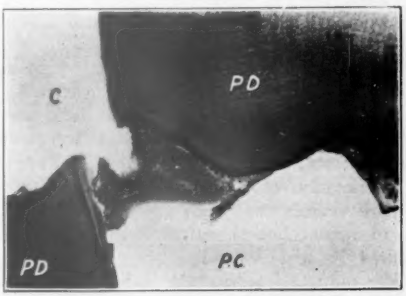

Fig. 9.—Decalcified section of deciduous mandibular second molar in which there was no deposition of secondary dentin in response to caries. C, cavity. PC, pulp chamber. PD, primary dentin. (×36.)

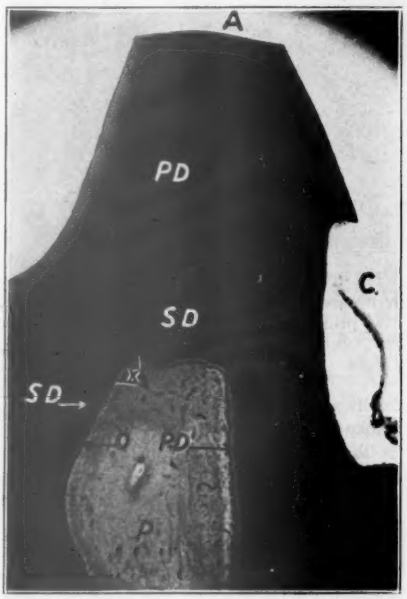

Fig. 10.—Decalcified section of deciduous maxillary cuspid. A, abraded incisal surface. C, cavity. PD, primary dentin. SD, secondary dentin. P, pulp. O, odontoblasts. PD', predentin. (×36.)

the blow. The section of this tooth (Fig. 5) shows the amount of secondary dentin deposited. Even though the carious area was more extensive in this tooth, the pulp remained vital and in excellent condition.

CASE 4.—The tooth was a mandibular first deciduous molar, and ammoniacal silver nitrate and eugenol were applied to the cavity just before the tooth was extracted in order to ascertain the degree of penetration of the silver solution. All of the distal surface, as well as a large amount of the occlusal surface, had been destroyed by caries. Examination of the ground section of this tooth reveals that both the mesial lingual and mesial buccal pulpal horns had been filled in with secondary dentin. (Fig. 6.) The pulp had apparently undergone a general calcific change similar to senile pulpal calcification, which takes place in the permanent teeth. There was an enamel lamella on the mesial buccal cusp which extended through the enamel to the dentin. Figure 7 is a photomicrograph of this portion of the section. The enamel lamella and the clogged tubules leading from the enamel lamella to the horn of the pulp are plainly visible. It is problematical whether the irritation transmitted through this enamel lamella to the dentinal tubules and then to the pulp was responsible for some of the secondary dentin formation. When the section is viewed by polarized light, the path of the tubules from the enamel to the pulp through which the stimulation traveled is brought out more clearly. (Fig. 8.) It also shows that the tubules became calcified or clogged as a result of this irritation.

CASE 5.—Not all of the deciduous teeth form secondary dentin. Figure 9 is a photomicrograph of a decalcified section of a deciduous mandibular second molar in which there was no deposition of secondary dentin in response to caries. This tooth was extracted from the mouth of a five-year-old boy whose examination chart showed that he had had bronchial pneumonia twice and was subject to frequent colds. The mother also informed me that his appetite had never been good and that he was a finicky eater. The general lowered resistance of this boy, which in turn may have affected the resistance of the pulp tissue to such an extent that it was incapable of responding to the irritation, may have been the reason for the inability of the pulp to lay down a protective covering of secondary dentin. Other cases similar to this have been observed.

CASE 6.—A decalcified section was made of a mandibular right deciduous cuspid, the incisal surface of which showed evidence of abrasion. The tooth was extracted to permit the eruption of the permanent cuspid. The quantity of secondary dentin formed opposite the abraded area is shown in the photomicrograph of the section. (Fig. 10.) There is

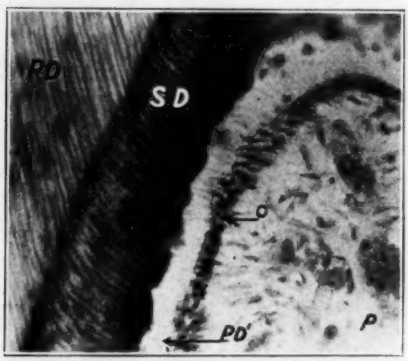

Fig. 11.—Area of secondary dentin shown in Figure 10 (portion of section marked X). PD, primary dentin. SD, secondary dentin. PD', predentin. O, odontoblasts. P, pulp. (×500.)

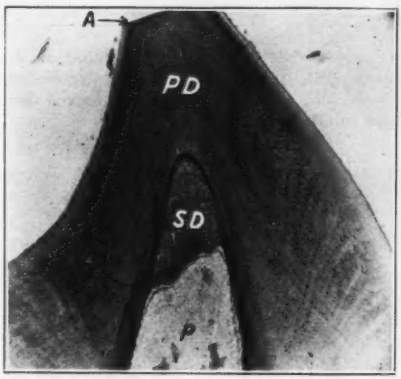

Fig. 12.—Decalcified section of deciduous maxillary cuspid. A, abraded incisal surface. PD, primary dentin. SD, secondary dentin. P, pulp. (×36.)

also evidence of secondary dentin formation all along the periphery of the pulpal wall and especially opposite the cavity on the labial surface. It is noted that this secondary dentin is of a very good quality and resembles closely the structure of primary dentin. Figure 11 shows an area of this secondary dentin under high magnification. The cavity in this tooth was treated on March 30, 1939, by removing all of the carious dentin and then applying a 10 per cent aqueous solution of tannic acid. (This tooth is one of approximately fifty which have been treated with tannic acid, an agent with which we are experimenting at the present time.) There was no filling placed in the cavity following this treatment. The tooth was extracted February 15, 1940. The section shows that the pulp was in excellent condition.

Fig. 13.—Decalcified section of deciduous maxillary second molar. PD, primary dentin. SD, secondary dentin. N, nodule of secondary dentin. P, pulp. (×36.)

CASE 7.—A deciduous maxillary cuspid was extracted from the mouth of a 12-year-old girl to permit the eruption of the permanent cuspid. The incisal surface was slightly abraded, but there were no carious areas in the tooth. The decalcified section shows the secondary dentin formed opposite the abraded area. (Fig. 12.) More of the incisal surface had been worn away toward the lingual than had been worn away toward the labial surface, the incisal surface having a decided pitch lingually. The deposited secondary dentin follows the same angle, more being formed on the lingual side than on the labial side. As in the preceding case, secondary dentin of a very good quality had been deposited all around the periphery of the pulpal wall.

CASE 8.—An upper right second deciduous molar was extracted from the mouth of a 12-year-old girl in order to permit the eruption of the second permanent bicuspid.

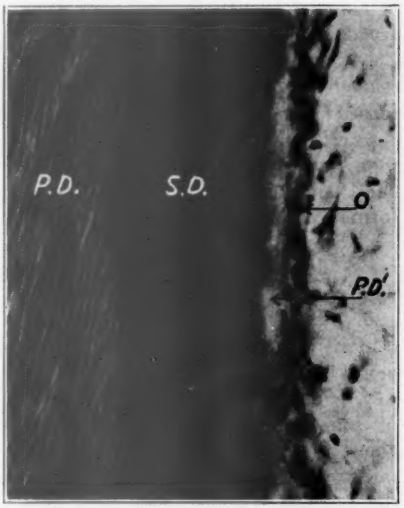

Fig. 14.—Area of secondary dentin shown in Figure 13. PD, primary dentin. SD, secondary dentin. O, odontoblasts. PD', predentin. (×350.)

There were no carious areas in the tooth and no evidence of abrasion of the enamel was present. Examination of the decalcified section of this tooth revealed a small amount of secondary dentin formation around the whole periphery of the pulp. (Fig. 13.) That the secondary dentin was deposited slowly is evidenced by its structure, which is hard to distinguish from the primary dentin. A higher magnification of an area of this secondary dentin is shown in Figure 14.

SUMMARY

1. Secondary dentin is formed in the deciduous teeth in response to caries, abrasion and chemical and thermal irritation much the same as in the permanent teeth. In some cases, the deposition of secondary dentin is perhaps more extensive in the deciduous teeth than in the permanent teeth.

2. The various types of secondary dentin formed in the permanent teeth can also be demonstrated in the deciduous teeth.

3. Only a small portion of dentin need be exposed for the formation of secondary dentin in the deciduous teeth.

4. The deciduous teeth, like the permanent teeth, vary in their ability to form secondary dentin. It has been observed that there is a direct relationship between the general health of the child and the ability of the teeth to form secondary dentin.

5. Strong stimulation causes a more rapid deposition of secondary dentin which is atypical in structure.

6. Mild stimulation causes a slow deposition of secondary dentin which is more like primary dentin in structure.

7. Sections that we have made to date of sound deciduous teeth which were about to be exfoliated have shown secondary dentin formation. In these cases, the secondary dentin had been formed slowly and in structure resembled closely primary dentin. This reaction in the deciduous teeth corresponds to what gradually takes place throughout the life of many permanent teeth.

This study on secondary dentin formation in the deciduous teeth was undertaken in cooperation with the Department of Oral Histology at the University of Nebraska, College of Dentistry, to ascertain whether, under similar conditions, the deciduous teeth react to form secondary dentin the same as the permanent teeth, and is a report of our findings to date. The assistance of Fred W. Webster and Mrs. Ruth Frey was given in carrying out this study.

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DENTAL ASPECTS OF CONGENITAL SYPHILIS

By J. C. Brauer,* D.D.S., M.Sc., and C. H. Blackstone,† D.D.S., Iowa City, Iowa

THIS study of congenitally syphilitic children was undertaken with the objective of determining the relative incidence of dental stigmata of syphilis in both the deciduous and the permanent dentition. The relationship between syphilis and certain changes in the permanent dentition has long been recognized, but the view has been generally held that syphilis is not likely to produce characteristic dystrophy in the deciduous teeth.[1, 2] In order to evaluate the possibility of changes in the first teeth resulting from syphilis, a review of certain facts relating to the transmission of syphilis to the second generation and to the developmental history of the teeth seems desirable.

Though the view is still held by some that the ovum may be infected at the time of fertilization,[3, 4, 5] the belief prevails that the infection of the fetus takes place through the placenta.[6, 1, 2, 7] As a basis for the current belief, the finding of spirochetes in a fetus of less than 16 to 18 weeks seems never to have been recorded.[7] The fact that infection of the fetus may occur as early as the fifth month is important in this discussion. When spirochetes enter the body of the fetus, they "find little resistance in multiplication and they spread freely, finding their way presumably to all organs and tissues."[1] Thus, it seems probable, at least in many instances, that the spirochetes are carried to the site of developing teeth. That they are carried to the nose in a high percentage of syphilitic babies is obvious, because approximately 70 per cent of these infants have syphilitic rhinitis.[1] Often, the rhinitis is of sufficient severity to compel mouth breathing for a long period, an event that may have an important effect on the growth of the jaws. That it may result in arrested development of the nasal structures is attested by the occasional occurrence of the deformity known as saddle nose.

Dystrophic changes in the deciduous teeth of syphilitic children are observed most frequently in the incisors. Schour and Massler[8] report that the deciduous central incisor has its initiation and histodifferentiation stage at approximately 7 weeks *in utero*, that the apposition of the enamel and dentin begins at approximately 4 to 4½ months *in utero* and that the crown of this tooth is about five-sixths formed at birth. Since the last phase of incisal apposition takes place at the seventh to eighth month of fetal development, it is conceivably possible that apparent hypoplasia of the central lobe could be a manifestation of syphilis. If the cupping and notching of the deciduous incisors are not caused by syphilis, a question arises as to other possible causes. Schour says that it is difficult to explain why the central lobe in any anterior tooth is affected more than any other region of the same tooth. He believes it possible that the blood supply is especially rich in the region of this growth center and that toxins or spirochetes may become active there.

Of the thirty-eight patients of this study, sixteen had deciduous incisors

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(see table), and of these, six, or 37 per cent, had notching or cupping of the central lobe. (Figs. 1 and 2.) Tapering of the deciduous incisors, such as is present in the hutchinsonian tooth, was not observed. Two patients had severe enamel hypoplasia of the posterior deciduous teeth (Figs. 4 and 5) and one of these had an open bite in the anterior segment.

Dystrophic changes have been reported in deciduous teeth, similar in some respects to those occurring in the permanent teeth as a result of syphilis, but in non-syphilitic children.[6] The finding of such teeth in non-syphilitic children does not constitute a strong argument against syphilis as a cause in syphilitic children, as typical hutchinsonian teeth of the permanent dentition have been reported in the absence of syphilitic infection. It has been customary to think of the dystrophic changes in teeth resulting from syphilis as having their origin at the time the infantile syphilis has its greatest clinically evident activity. This period is shortly after birth. Changes in the deciduous teeth such as those observed by us presumably had their origin before birth. A definite conclusion as to the relationship of syphilis to these changes in the deciduous teeth is difficult or impossible, yet the possibility remains that the changes are dependent on this infection. Syphilitic infection of the fetus is admittedly possible before the stage of tooth development involved in the tooth changes found.

Fig. 1.—"Screwdriver" shaped permanent central incisors at 21 months. The upper left deciduous central incisor has a slight notching or cupping in the central lobe.

Fig. 2.—Upper central incisors showing definite cupping or notching in the central lobe at 3½ years.

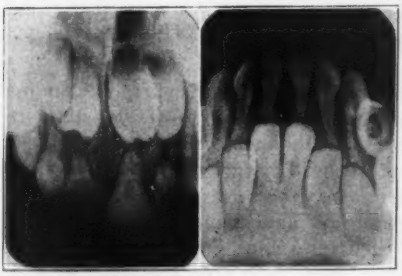

Fig. 3.—Permanent central incisors notched and tapered at 4½ years. These are typical hutchinsonian central incisors.

We prefer not to express an opinion with reference to the relationship of syphilis to the changes in the deciduous incisors in the six instances observed, but we are inclined to believe that either

syphilis or antisyphilitic therapy in the mother can be definitely identified as a cause of the enamel hypoplasia of the posterior teeth observed in two patients.

The permanent teeth were examined in thirty-six of the thirty-eight patients in the study, either by direct inspection or by roentgenograms (table). Dystrophies of various types were observed much more frequently than has been reported.[9, 10, 11] Twenty-four (63 per cent) had notched or tapered incisors; eight, or 21 per cent, had notchings; two of the eight also had tapering. Eighteen patients (50 per cent) had tapering of the central incisors. Nine, or 37 per cent, of

Fig. 4.—Severe hypoplasia of all posterior deciduous teeth at 3½ years. There is also an open bite in the anterior segment.

the twenty-four patients with abnormal incisors also had hypoplasia of the enamel. Fourteen patients (37 per cent) had mulberry first permanent molars. The majority of the permanent central incisors and molars did not show enamel hypoplasia. Some of the notched incisors had apparently good enamel in the area of cupping (Fig 6). Others had hypoplasia (Figs. 7, 8, and 9). Mulberry molars may or may not have enamel hypoplasia. Figure 10 illustrates a general dwarfing of the first permanent molar without enamel hypoplasia. The enamel was continuous and had fair distribution over the whole tooth. In this and similar cases, it seems probable that the dentinoenamel junction was altered in its pattern before apposition or deposition of enamel took place.

One may find a central incisor or a

Fig. 5.—Case shown in Figure 4. The deciduous molars with hypoplasia can be seen. The first permanent molars, which may be called mulberry molars, are constricted toward the occlusal aspect.

Fig. 6.—Tapered central and lateral incisors in upper and lower arches with slight notching in upper central incisors. (Age 13.)

molar malformed, but the remaining incisors, molars and other teeth apparently normal. Such a finding is somewhat difficult to explain on the basis that the dystrophy is a result of a systemic effect

STATUS OF TEETH OF THIRTY-EIGHT CONGENITALLY SYPHILITIC CHILDREN

Number	Age, Years	Medical Treatment Started	Deciduous Tooth Form			Permanent Tooth Form					Oral Condition				
			Normal	Small	Notched	Normal	Small	Tapered	Notched	Mulberry	Normal	Hyperemia	Blue-Black Line	Pyorrhea	Calculus
1	¾	5/40									x				
2	1½	6/40	M*		I						x				
3	1¾	10/38	M		I			I†			x				
4	2	10/38	M		I			I†			x				
5	2½	11/39	M		I			I†		M†		S¶	S		
6	3	2/37	IM			M†		I†			x				
7	3	1/40	M		I	I†				M†		E			
8	3	12/39	I	M		M†			I†		x				
9	3	/36	IM			M†		I†			x				E
10	4	1/40	IM			I†M†					x				
11	4	6/39	‡		I			I†		M†		E	E		
12	5	8/35	I	M		I†M					x				
13	5	4/39	IM			I†M†					x				
14	6	9/36	IM			M		I†				S	S		
15	7	7/40	IM			M		I†				E			
16	7	7/39		IM		M		I†				S			
17	8	7/40				IM					x				
18	8	1/40	IM					I†		M		E			
19	8	6/38					IM		I	M		E			
20	8	7/36				M		I				S			
21	8	3/33				M	I				x				
22	8	7/37	#			M		I					S		
23	9	3/37					IM	I		M		E			
24	9	12/40					M	I	I	M	x				
25	9	8/38				M		I				E			
26	9	12/38					IM	I		M		E	S		
27	10	8/37				IM						E	E	S	S
28	10	2/39							I	M		E	E		
29	12	6/38					IM	I	I	M		E	S		S
30	13	9/37					I		I	M		E	E		E
31	13	/36					IM					E			
32	13	5/34				IM					x				
33	14	9/39				IM						E		E	S
34	14	7/38				I	M			M		E			
35	14	7/38							I	M		E			E
36	15	9/34				M			I			E			E
37	16	9/32					I	I		M	x				
38	17	/35				IM						E	E	E	E

*M, molars; I, incisors. †, roentgenogram ‡, severe hypoplasia. #, hypoplastic molars.
¶S, slight; E, marked.

of syphilis. It seems more logical to consider that an individual local disturbance occurs at the site of morphodifferentiation or histodifferentiation or apposition, as the case may be. Differentiation, or the laying down of the dentino-enamel junction pattern, which governs the size and shape of the tooth, occurs at from

4 to 6 months *in utero*. It seems reasonable, therefore, that at this fetal age the first permanent molars and permanent central incisors are adversely affected by syphilis, instead of after birth as has been assumed by some authors. It is difficult to understand why the permanent cuspid is not more often affected. Figure 9 is an illustration of hypoplasia of the lower permanent cuspids.

Fig. 7.—Disturbance in form which took place during histodifferentiation stage of developing tooth, as well as disturbance during apposition or calcification. The upper right permanent central incisor is unerupted, and the roentgenogram shows it to be smaller than the erupted upper left central incisor.

Several observations incidental to this study seem of interest. Some of the children had subnormal anterior maxillary growth, manifested by an open bite. (Figs. 4, 7, and 9.) A difference in eruption or exfoliation time was not apparent in our syphilitic patients as compared with the average normal child.

Often the gums show adverse effects of syphilitic treatment. The children of this study received arsphenamine, bismuth salicylate and mercury with chalk in the course of their treatment. Only fifteen of the thirty-eight patients had a normal gingival condition. No doubt some of the abnormalities found were unrelated to treatment; e.g., some instances of hyperemia. The incidence of marked hyperemia of the gingival tissues

Fig. 9.—Slight hypoplasia, particularly of lower permanent cuspids, at age 9, with malformation of central incisors and lateral incisors. An open bite is also evident.

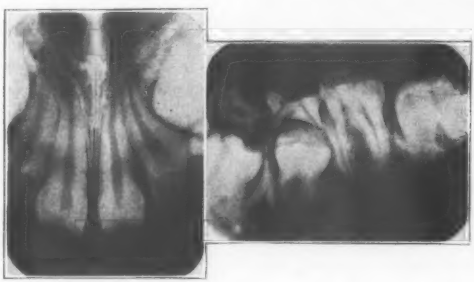

Fig. 8.—Hypoplastic and malformed permanent central incisors and first permanent molars at 8 years of age.

was much greater in this study group (47 per cent of the group) than in average young dental patients. Three patients had pyorrhea with resultant bone destruction. Eight had salivary calculus and ten had the blue-black line of bismuth on the free gingivae (Fig. 11). The question arises as to whether the bismuth line is produced by a deposit of free metal or by a deposit of a metallic salt.[12, 13] Since only ten of the patients had such a line, the question arises as to whether the line is a result of overtreatment or of an unusual oral condition.

Figure 12, presenting a patient who had neurosyphilis, is interesting from the periodontal point of view. In addition to antisyphilitic treatment, the patient had received phenobarbital for four years for the control of epileptiform seizures. She showed marked hyperemia of the peridental tissues, presumably as the result of continual intake of barbiturates.

Fig. 10.—Typical mulberry first permanent molar. There is no hypoplasia of the enamel, but rather a constriction which in all probability took place during the histodifferentiation stage of the developing tooth.

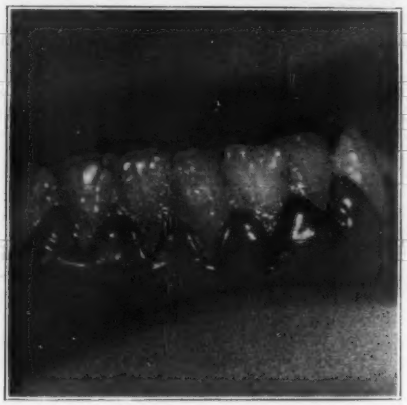

Fig. 11.—Normally formed teeth. (Ten years.) There are hypertrophy and hyperemia of the gum structures. Treatment was begun February 1939. There is a definite blue-black line at the free margins of the gum tissue, probably due to the bismuth treatment.

SUMMARY AND CONCLUSIONS

Thirty-eight children with congenital syphilis were examined with reference to their dental status. About three of every four patients had some dental stigma probably related to this infection. Of the sixteen children who had deciduous incisors, 37 per cent had cupping or notching of the central lobe of these teeth in the incisal region. Two of the children had marked enamel hypoplasia of the posterior deciduous teeth. There was evidence that these changes in the deciduous teeth could be a result of syphilis, in contrast to the generally held view that syphilis does not cause changes in the deciduous dentition. Though we prefer not to state definitely that the changes in the incisors are the result of syphilis, we believe that the enamel hypoplasia observed in the posterior deciduous teeth can be attributed to syphilis or to antisyphilitic treatment of the mother.

It was possible to examine the permanent teeth of thirty-six children either directly or by means of roentgenograms. The frequency of dental dystrophy was greater than that previously reported by other observers. Sixty-three per cent had notched or tapered incisors; 21 per cent

had notching and 50 per cent tapering. Enamel hypoplasia was present in 37 per cent of the twenty-four patients with abnormal incisors. Mulberry molars were present in about 37 per cent of the children, some with and some without enamel hypoplasia.

Syphilis apparently had no effect on eruption or exfoliation time in the average case.

Antisyphilitic treatment affected the gums adversely in a high percentage of the children. Marked hyperemia occurred much more frequently than in nonsyphilitic children. Ten of the thirty-eight patients had a bismuth line, three had pyorrhea and eight had salivary calculus.

Fig. 12.—No malformation. The gum structure is hypertrophied and hyperemic. The patient has had barbiturates for approximately four years.

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EFFICACY OF LOCAL USE OF SULFATHIAZOLE POWDER IN DENTISTRY AND ORAL SURGERY

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THE principles upon which the local use of sulfathiazole powder is based have been described elsewhere.[1, 2, 3] Sulfathiazole has been shown by the marrow culture method to be more effective against more varieties of bacteria than any other drug of the sulfanilamide group so far studied,[3] and much more effective against streptococci than sulfanilamide itself. None of these drugs is effective against large numbers of organisms; therefore, oral administration cannot be expected to clear up local infections in which there are always large numbers of organisms. By the local application of sulfathiazole powder before infection has occurred or after temporary removal of the majority of the organisms by draining collections of pus and rinsing the areas clear of pus and necrotic tissue with a suspension of sulfathiazole powder in a physiologic solution of sodium chloride, a concentration ten to twenty times that obtainable by mouth can be maintained over a period of time. The drug is completely non-irritating and causes no pain when applied to acutely infected tissue. The absorption of the powdered drug into the blood stream is negligible no matter how much of it is present, except in very large cavities, because about 1 liter of fluid is required to hold 1 gm. of the drug in solution, and absorption can occur only from the drug which is in solution. An excess of the powder, therefore, really increases the length of time before another application is necessary without changing the concentration locally obtained or affecting the amount of the drug absorbed.

The local use of sulfathiazole powder has two major applications in dentistry and oral surgery: to prevent infection and to control infection which has already occurred. When infection is not present, the powder need only be placed in the tooth socket or applied to the operative field. When infection is present, all necrotic tissue must be removed and all pus rinsed away with a suspension of the powder in saline solution. In such procedures, a 10-cc. syringe may be used satisfactorily by mixing 1.0 to 2.0 gm. of sulfathiazole powder in 8.0 cc. of physiologic solution of sodium chloride in the syringe and shaking the mixture well to maintain the suspension before and during the irrigation. If the latter procedure is not carried out, the powder will quickly settle to the lowest portion of the syringe, many times completely blocking the lumen of the cannula or permitting only a weak suspension of the mixture to be expelled. By mixing the sulfathiazole powder with a water-soluble lubricating base or chemically pure glycerine, a mixture is made which can easily be injected into infected wounds, sockets or incisions, and the sulfathiazole powder is held in suspension without any apparent inhibition of its action.

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To apply sulfathiazole powder directly to the tissues without the use of a carrying medium, a three-sixteenths inch tube about 6 inches long with a plunger can be used in the average case, and a three-eighths inch tube with a plunger can be used for the larger wounds. The sulfathiazole powder is placed in the tubes by pulling the plunger back 2 or 3 inches and tamping the end of the tube into the sulfathiazole bottle or container. The end of the tube is then placed in the wound, incision or tooth socket, and the plunger is pressed down until the powder is all expelled. If postoperative dressings are required in areas where the powder cannot be retained or placed conveniently, one-quarter or one-half inch iodoform gauze or plain gauze strips may be well saturated with ethyl aminobenzoate ointment, pure glycerine or a water soluble viscid medium in which is incorporated the sulfathiazole powder and these strips then inserted in the wound. These dressings should be changed every day or every other day, the interval depending on the severity of the infection.

Immediately after extractions, curettement to remove infected material and removal of bone spicules, the socket or sockets may be filled with sulfathiazole powder. The gums are sutured if necessary, and a roll of gauze is placed over the area for the patient to bite on in such a manner as to form a compress to retain the powder and to exclude saliva. This gauze compress should be kept in place from fifteen to thirty minutes. This procedure is applicable after nearly all surgical procedures in the oral cavity. If a portion of the clot in a tooth socket dissolves postoperatively, a dressing can be made up of sulfathiazole powder with a sufficient amount of chemically pure glycerine, ethyl aminobenzoate ointment or a water soluble viscid medium to form a thick paste, which may be applied either alone or with gauze after thorough irrigation. If gauze is not used, the glycerine or water soluble viscid medium dressings need not be removed, since they will be absorbed by the tissues. Additional dressings, if indicated, may be replaced whenever necessary to give a maximum of comfort to the patient. Gauze dressings should be replaced at least every forty-eight hours.

Acutely infected third molar flaps can be treated with sulfathiazole powder very effectively after irrigation by placing a small wick of gauze saturated with sulfathiazole powder, plus the base, in the pocket laterally or distally from the tooth, repeating the procedure if necessary, every twenty-four to forty-eight hours, until the inflammation has subsided.

I have used sulfathiazole powder by implantation postoperatively with very satisfactory results in two cases of osteomyelitis of the ramus and mandible; one fracture of the mandible with drainage; three cases of cellulitis of the maxillae, and two cases of cellulitis of the mandible. Also, immediately after operations and postoperatively, I have used it in one follicular cyst of the ramus and mandible; one radicular cyst of the mandible; sixty-seven impacted unerupted mandibular third molars; forty-nine impacted unerupted maxillary third molars; eighteen impacted unerupted cuspids; two hundred eighty-seven devitalized or infected teeth, and twenty-four cases of residual infection of the maxillae and mandible. In all of these cases, a marked improvement was noted as compared with other similar cases observed previously. After surgical procedures in the oral cavity, healing by first intention usually occurred even in the difficult cases.

REPORT OF CASES

CASE 1.—Mrs. J. B., aged 52, weighing 177 pounds, and apparently in good physical

condition, November 1, 1940, complained of pain and swelling in the right mandibular third molar region. Clinical examination disclosed that the mouth and teeth were in exceptionally good condition, with the lower right third molar missing and pus exuding from that region. Dental roentgenograms indicated the presence of the lower third molar roots, which, the patient stated, an attempt had been made to extract twenty-five years previously. A lack of density of the process immediately posterior to the roots was also evident. Irrigation and medication of the area for six days reduced the swelling, inflammation and exudation.

November 7, 1940, the roots were removed and the infected osseous process curetted. Pain and swelling were persistent and could be controlled only by the administration of heavy doses of narcotics. Sulfanilamide was given internally as well as implanted in the wound daily with sedative dressings following irrigation. The lower right second molar became loose and painful and, December 4, this tooth was removed under nitrous oxide anesthesia. The pain and swelling continued and, on December 8, the patient was hospitalized. Daily irrigations and dressings were continued, together with dietary measures and vitamin therapy.

Anterior-posterior and lateral roentgenograms disclosed the beginning of an osteomyelitis in the angle of the ramus and mandible. Adequate drainage was established and there was a copious flow of pus. Extensive swelling was present extending from the angle of the ramus and mandible to the temporal region and posteriorly to the ear. The Murphy drip system of continuous hot saline irrigation was instituted in the oral cavity directly over the infected area. This procedure, together with the continued use of hot compresses externally, brought about some relief from pain, but the persistent flow of pus continued.

December 9, the white blood cell count was 15,000; December 15, it was 18,000, and December 26, it was 18,000. At the suggestion of one of us (E. E. O.), a direct implantation of sulfathiazole powder was made, January 12, 1941, after thorough irrigation. Within twenty-four hours, the drainage had ceased and the patient was more comfortable. This treatment, together with hot saline irrigations, was continued daily. The white blood cell count January 14 was 14,500 and January 27, it was 7,000, or normal. The temperature had consistently been between 102° and 103° F., and, on the third day after the direct implantation of sulfathiazole powder, a marked fall was noted. By the sixth day, the temperature was normal, and it has remained normal to date. Anterior-posterior and lateral roentgenograms taken during this period disclosed the beginning of sequestration of the ramus and mandible and the neck of the condyle. Another roentgenogram reading, February 11, stated: "The lateral projection again demonstrates increased mottling and decalcification in the body and ascending ramus of the right mandible, with the positive evidence of sequestration." Another reading, March 1, stated: "Comparison with the projections of February 11 reveals no further extention of the osteomyelitis. Some fragmentation is present and a fracture has developed in the neck of the condyle." It is believed that at least a fibrous union of this possible fracture will take place and that other sequestra will unite.

The patient was dismissed from the hospital February 16, 1941, and continued receiving daily care until March 10, 1941, after which treatments were given every other day. The blood level was not changed in the least by the direct application of sulfathiazole powder. The patient suffered no discomfort or inconvenience as a result of this condition, and there was no drainage. The swelling disappeared, and normal movement of the mandible was reestablished. A small opening in the region of the second molar was irrigated and dressed with sulfathiazole powder, ethyl aminobenzoate ointment and gauze. It is believed that this treatment can be safely discontinued in the near future. Three small sequestra were removed from the third molar region April 14, 1941.

In the five cases of cellulitis in which sulfathiazole powder was applied directly, all patients recovered in much less time and with less discomfort than is usual with such complications.

CASE 2.—Mrs. S. A., aged 30, weighing 123 pounds, and apparently in good health, but with a temperature of 101° F., complained of swelling and pain in the maxillae

five days after the removal of an impacted unerupted maxillary third molar. Drainage was established, the area was irrigated and 1.0 gm. of sulfathiazole powder with ethyl aminobenzoate ointment and gauze was implanted. A hot saline mouthwash and hot compresses were prescribed for home care. The following day, the temperature was 99.8° F., and the patient was more comfortable. No drainage was apparent and the swelling was less noticeable. The infected area was irrigated and dressed with sulfathiazole powder, ethyl aminobenzoate and gauze. On the third day, the temperature was normal, the patient quite comfortable, the swelling reduced and no drainage present. This routine treatment was proceeded with daily until the sixth day, when the patient was dismissed.

CASE 3.—A man, aged 38, weighing 174 pounds and very toxic, with a temperature of 100.2° F., complained of swelling and pain along the lower border of the mandible extending along the ramus to the condylar region. The left mandibular second molar had been removed seven days previously and pain had been constant since that time. The patient was hospitalized, nitrous oxide was administered and an incision was made extending along the lateral border of the ramus for drainage. When the exudation of pus ceased, 1.0 gm. of sulfathiazole powder was implanted in the deepest part of the incision, and a dressing of 1.0 gm. of sulfathiazole, ethyl aminobenzoate ointment and gauze was inserted. Hot compresses were applied and sedatives were prescribed. The following morning, the temperature was normal, with no drainage present and the swelling was reduced. The patient was very comfortable. Daily irrigation and sulfathiazole implantation were carried on for three days, and the patient was dismissed.

CASE 4.—A man, aged 26, four days after the removal of an impacted unerupted maxillary third molar, had a temperature of 101.4° F., with swelling and pain. The socket was open, and a cannula was inserted in it and along the tuberosity to a depth of about 3 cm. Sulfathiazole in a physiologic solution of sodium chloride was used for irrigation, followed by the implantation of sulfathiazole powder with ethyl aminobenzoate ointment and iodoform gauze. Hot compresses and a hot saline mouthwash were prescribed, together with a forced fluid intake up to 3 liters a day. The following day, the temperature was 99.9° F. The swelling was somewhat reduced, and the patient was much more comfortable. The same treatment of irrigation and sulfathiazole implantation was carried out. On the third day, the temperature was 98.8° F. and there was less swelling and no pain. The infected area was again irrigated and dressed with sulfathiazole. The temperature was normal on the fourth day, although some swelling still existed. Regular daily treatments were proceeded with for three more days, and the patient was dismissed.

The other three cases of cellulitis treated ran courses similar to those cited, and all responded quickly to the direct application of sulfathiazole powder. The usual x-ray therapy and rubber drains were not required in any instance, and a more rapid recovery was secured than is usual in such cases.

CASE 5.—After the removal of a follicular cyst extending from the sigmoid notch of the ramus to the first molar region of the mandible, including the removal of an unerupted third molar which was lying in the region of the inferior border of the ramus near the angle, the entire cavity was filled with sulfathiazole powder. A small wick of iodoform gauze saturated with benzocaine ointment and sulfathiazole powder was placed in the first and second molar region. The following day, the patient called at the office (P. L. M.) and exhibited a relatively small amount of swelling, but complained of very little discomfort. The temperature was 99.9° F. The third day, the patient again made an office call, and no additional swelling was apparent. There was no discomfort, and the temperature was 99° F. The patient was released to the care of his dentist, who reported ten days later that the wound was healing very satisfactorily by first intention.

CASE 6.—In the case of a large radicular cyst of the mandible in the region of the second bicuspid, wherein a root fragment was removed from the inferior dental canal, the area was filled with sulfathiazole powder. The patient suffered no more discomfort or inconvenience than would have occurred

from an ordinary extraction. Healing was by first intention.

In sixty-seven cases of extraction of impacted unerupted mandibular third molars, sulfathiazole was placed in the sockets. The postoperative reactions of pain and swelling were much less than is usually experienced in such cases.

Sulfathiazole was placed in the sockets of forty-nine impacted unerupted maxillary third molars and eighteen impacted unerupted maxillary cuspids. Healing was uneventful, but such healing in these areas is not unusual under ordinary care. However, there was little discomfort or postoperative swelling, and this may indicate to some extent the value of sulfathiazole medication.

In the handling of sockets from which devitalized teeth have been removed, sulfathiazole powder appears to have a definite value in the prevention of the so-called dry socket. In 287 cases, sulfathiazole powder was implanted after extraction, and although in every case there was not healing by first intention, no dry sockets developed. It has been very evident also that the patients experienced less pain and swelling than are usually encountered on the removal of such teeth.

Sulfathiazole was placed in twenty-four areas of residual infection after operation, and healing was uneventful, as is usual in such cases; but less swelling and discomfort were present than are generally noticeable from operations of this type.

Observations are now being made with regard to the use of sulfathiazole powder incorporated in caroid powder for postoperative surgical dressings, but to date no definite information is available.

SUMMARY

Local application of sulfathiazole as a prophylactic measure after 287 tooth extractions and 160 operative procedures in the oral cavity resulted in a decreased incidence of infectious complications and greatly decreased the duration and amount of discomfort, swelling and disability.

Local application of sulfathiazole powder after drainage and irrigation for control of preexisting infection was employed in two cases of osteomyelitis of the ramus and mandible, one fracture of the mandible with drainage and five cases of cellulitis of the mandible and maxillae.

The local application of sulfathiazole powder has proved more effective in the prevention or control of infection in dentistry and oral surgery than has any measure previously used.*

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NEW LIGHT ON DENTAL CARIES OR THE INFLUENCE OF THE MODERN DIET ON BACTERIAL EVOLUTION

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WITHIN recent years, it has been pointed out by Price[1] and many others that dental caries is but one of a group of diseases or conditions which are prevalent in civilized communities and rare or absent in isolated primitive groups.

Price has advanced theories as to the relationship of diet to health, and whether we disagree with these theories in whole or in part is of little consequence, for our attitude cannot possibly detract from the fundamental truth or minimize the significance of Price's observation that primitive races when compared with their civilized brethren, individual for individual, are physically superior.

There is much evidence that appendicitis, gallstones, peptic ulcer, tonsillitis and even such diseases as diphtheria and scarlet fever have a geographic distribution roughly comparable with that of dental caries. That is, the spread of infectious and degenerative diseases tends to parallel and keep pace with the advances made in the civilized mode of living.

This susceptibility of civilized peoples and immunity of savages make it apparent that there are adverse environmental influences among the former which are absent, inoperative or ineffectual among the latter. In that this savage immunity has disappeared wherever and whenever the refined foods of commerce have appeared, it is generally held that the present physical status of modern man comes from the unwise selection of food.

While the evidence is conclusive that the adoption of the modern diet has had disastrous effects upon the human race, we are still without an adequate explanation as to its mechanism, and, as a result, intelligent interference with the course of events is still impossible.

It is not suggested that dental caries (caries acuta) has any direct relationship to the etiology of the associated diseases of civilization, but it is probable that all result from a related group of adverse influences which have been set in operation by modern dietary habits. For many reasons, the study of dental caries offers a logical approach to the study of those diseases which have followed the modern diet into civilization, and with which it has a geographic distribution in common.

It is well-established that many primitive races subsisting on either carnivorous or carbohydrate diets exhibit a high natural immunity to dental caries. These diets may be deficient in food essentials and, in many cases, may be maintained for long periods at almost starvation levels, with no effect on the gross appearance of the teeth. This immunity comes not from the hardness of the teeth, the insolubility of the enamel or the resistance of the teeth themselves to the decay process, for they undergo

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rapid destruction when civilization is encountered.

Staz[2] has shown that microscopically and grossly, and in their resistance to solution by acids, it is impossible to differentiate between the teeth of immune primitive people and those of susceptible Europeans. Variations in immunity to dental caries must be considered to be due to environmental changes induced by the diet rather than to changes in the teeth themselves, for devitalized teeth usually exhibit a degree of susceptibility or immunity comparable to that of the environment in which they are placed.

In primitive communities where the forces which lead to dental caries are not operative, there is no correlation whatsoever between the adequacy of the diet from a nutritional standpoint and the incidence of this disease. However, in civilized communities, where these forces are operative, the incidence and the severity of caries show a positive correlation with the adequacy of the diet during the formation of the teeth and even in adult life.

In civilized communities, dental caries is more frequent and severe among the malnourished than it is among those who receive a more adequate diet; however, it is still an almost universal disease among all social groups. Modern individuals upon a common diet will develop the widest differences of susceptibility to dental caries, and once this individual susceptibility has been established, it will, within limits, remain remarkably constant for years regardless of the diet.

In addition to the diet *per se,* there are many other factors which are known to have a correlation with the incidence of caries in communities where the forces which cause this disease are active. It is well established that the fluorine intake may have a limiting influence on dental caries; yet it is well known that it is not completely effective in this respect, for, in addition to causing mottling, it may eventuate in delayed hypersusceptibility.

It is equally well established that where caries is endemic, its incidence varies with the hardness of the water and the ultraviolet radiation; that is, the incidence of dental caries and its progress are inversely proportional to the hardness of the water and the ultraviolet radiation. Its progress is more rapid in winter than in summer, and, further, it can be slowed by the administration of cod-liver oil or by artificial ultraviolet irradiation. However, primitive groups in the tropics, where ultraviolet radiation is intense, are approximately as susceptible to dental caries as are the Eskimos when the forces which lead to caries susceptibility are set in motion.

It is also well known that primitive children in whom rickets is endemic may exhibit a high natural immunity to caries. Thus, it is apparent that where the forces leading to caries activity are not operative, neither the presence nor the absence of vitamin D is correlated with its incidence. However, when immunity to caries is lost, vitamin D and ultraviolet radiation, while not preventing its occurrence, are of significant importance in limiting its progress.

In civilized communities, the course of dental caries can be favorably influenced by vitamin administration and mineral fortification. However, the absolute prevention of this disease cannot be secured by dietary manipulation as long as the basal diet of civilization remains essentially unaltered.

Many people are of the opinion that the extent of dental caries varies directly with the amount of carbohydrate consumed. While it is true that dental caries could not occur if fermentable carbohydrates were not consumed, it is equally true that a high degree of caries immunity may exist in races whose diet is

composed largely of easily fermentable carbohydrates.

This civilized susceptibility and primitive immunity cannot be explained by assuming that the carbohydrates consumed by the savage are fermented with less rapidity and the formation of less acid than are the carbohydrates eaten by civilized man. The whole saliva of civilized adults, as well as pure cultures of oral streptococci and lactobacilli, ferment and convert the natural carbohydrates wheat, oats, potatoes and the simple sugars into acid with greater rapidity than they do the refined carbohydrates, sucrose and white flour. In fact, sucrose is fermented and converted into acid more slowly than any other carbohydrate consumed by man.

In 1921, Seitz[3] found that it was possible to produce artificial caries in teeth by incubating them with a saliva and bread mixture. He found that, contrary to his expectations, the addition of marmalade and sweets to the mixture did not accelerate the process; in fact, in the case of marmalade, some retardation was evident.

While sucrose is, admittedly, in some way related to the etiology of dental caries, it is apparent that it is not in itself a specific exciting cause, for there is ample evidence that a high degree of caries immunity may exist even in the presence of excessive sugar consumption, and that, in some cases, the addition of sugar cane to a diet may actually increase the natural immunity to dental caries. (Larsen, N.P.).

Wohinz[4] states that the view that sugar damages the teeth is no longer tenable on the basis of recent observations. He continues that workers in sugar are consistently free from sugar caries and that bakers, on the other hand, exhibit marked tooth destruction. He states that the products of the degradation of carbohydrates ingested in the form of starch are more harmful to the enamel than those derived from sugar degradation.

Carl Schiøtz[5] says: "The carbohydrate theory must be abandoned, since Negroes on sugar plantations often have faultless teeth, even though about 75 per cent of their caloric requirement is covered by carbohydrates, and more than one-third of their total calories is represented by sugar." Larsen tells us that the addition of sugar cane to inadequate diets will lessen the incidence of dental caries.

Miller[6] states:

> If we divide a quantity of saliva into a number of equal portions, and add to each an equal quantity of different carbohydrates (sugar, bread, potato, starch, etc.), we shall find that those containing bread and potato not only show an acid reaction sooner, but even develop more acid in a given time than the portions to which sugar has been added.

In studying the relative significance of the human foods as acidifiers, Miller incubated the various carbohydrates with human and dog saliva. He found that bread, potato, corn, rice and macaroni were much more potent sources of acid than were sucrose, grape sugar and starch. In the dog, he found starch and sugar remained alkaline after thirty-five hours' incubation, and that potato became acid in twelve hours and bread in twenty hours.

Miller concludes:

> Most authors give sugar the chief place among those foods which exert an injurious action upon the teeth—again a conception which is not quite right. . . . In general, however, the chief rôle in the production of decay is performed by bread, potatoes, etc., not only because they produce more acid, but because they, on account of their insolubility, may remain for a long time sticking to or between the teeth, whereas the readily soluble sugar is soon diluted or carried away.

While the evidence is conclusive that sucrose is in some way related to the etiology of dental caries, it is apparent that the explanation of the cause and effect is much more profound than the

postulation that sucrose serves as a better source of acid for enamel decalcification than do the other carbohydrates consumed by man.

From the study of the natural occurrence of caries, it is found that native races may include in their diets carbohydrates from many sources, potatoes, tubers, cereals, cereal products and even white flour, and continue to maintain a high degree of natural immunity to dental caries as long as refined sucrose is excluded from their diets. It is well established that the addition of even small amounts of refined sugar to a native dietary will generally lead to the loss of natural immunity to dental caries.

The more unbalanced and inadequate the diet, and provided cereal forms a part of the diet, the more effective the sucrose in reducing the natural caries immunity. This observation has been repeatedly confirmed by many workers throughout the world. We have observed that civilized children on an inadequate diet rapidly lose their caries immunity when sucrose and cereal are consumed. We have further observed that the ingestion of even larger amounts of sucrose for long periods of time may not break down this natural immunity sufficiently in children on adequate diets to cause clinical susceptibility to the disease. Thus, we find that sucrose is, in conjunction with an inadequate diet, highly effective in setting in operation those forces which lead to dental caries, but is much less effective if a balanced diet is consumed. However, regardless of how adequately the diet may be reinforced with the various food essentials, the continued ingestion of sucrose and cereal will, in the vast majority of cases, lead to the loss of natural caries immunity and to eventual destruction of the teeth.

Waugh[7] has pointed out, from his studies and feeding experiments on Eskimos, that the ingestion of natural sugars, fruits and white flour does not lead to loss of caries immunity. He was so struck by the fact that sucrose was the only substance associated with caries susceptibility that he remarked: "An unsweetened tooth cannot decay"—a statement with which we agree.

While there are many factors, varied and multiple, in the human environment which limit and accelerate the carious process, the disease (caries acuta) as we know it in civilized communities could not occur without the ingestion of refined sucrose. In that sugar is not an effective acidifier, it is probable that it achieves its greatest effect in other ways than by simply providing acid for the dissolution of the enamel. It is well known that the saliva of monkeys, dogs, cows, horses and other mammals, including breast-fed babies (and presumably primitive man), in contrast to the high-acid-producing saliva of civilized man, is an alkaline or weak-acid-producing medium.

In a recent communication we pointed out that within a short time after a baby is placed on a diet consisting essentially of sucrose and cereal, the intact saliva becomes a high-acid-producing medium owing to the presence of highly acidogenic strains of bacteria. In our opinion, the basal flora must be converted into an acid-producing medium before acute caries is chemically possible.

While Miller's chemicoparasitic theory of the causation of dental caries is tenable, it is incomplete, for it offers no true explanation of the etiology of this disease. Previous profound changes must have taken place in the basal flora before it became an acid-producing medium and permitted the application of his theory.

The first purpose of any theory pertaining to the etiology of dental caries should be to explain how and why diet

increases the acid-producing potentialities of the oral flora. After this change has taken place and hypersusceptibility has been established, sucrose and even meat can be converted into acid with rapidity, and, without question, at this late date in the inception process of the disease, sucrose does contribute acid for the dissolution of the enamel. However, once acute caries occurs, bread and similar products, while unable to initiate caries, are nevertheless the chief sources of acid for enamel decalcification.

In order to completely understand this problem, it is necessary that we know the differences bacteriologically and epidemiologically between susceptible and caries immune groups.

For some time, it has been known that many of the infectious diseases, such as scarlet fever and diphtheria, which are constantly endemic in civilized communities, exhibit with dental caries an apparently capricious geographic distribution, being common in the temperate zone wherein resides the bulk of civilized mankind, and rare or unknown both in the arctic regions and in the tropics.

Kleine and Kroó[9] state that the injection of scarlet fever and diphtheria toxin into native East Africans, who incidentally have little tooth decay, did not produce the least reaction, and that the blood serum showed that these natives had acquired immunity to both these diseases. These observations, the authors say, are surprising since diphtheria is unknown in the villages in the interior of Africa, while scarlet fever is rare in all tropical countries.

The infrequency of scarlet fever in the tropics, where the incidence of caries is low, has been referred to in an editorial in the *Journal of the American Medical Association*.[10]

> For some thus far unexplained reason, scarlet fever is comparatively rare in the tropics. The disease has been repeatedly introduced into India, South America and the Philippines. Invariably only a local epidemic resulted, largely confined to newly arrived foreigners, and with a few cases developing among the native population.

The League of Nations (1929), in the report of the health section, states it as a well known fact that scarlet fever is a disease of temperate countries.

Heinbecker and Irvine-Jones[11] (1928) report that while both scarlet fever and diphtheria are unknown diseases among primitive Eskimos [who are almost immune to caries], the majority of them give both Schick and Dick negative reactions, and their blood, in both cases, contains the specific antitoxins of these diseases.

In 1931, Asbelew and Margo [12] studied the Schick and Dick reactions of 103 inhabitants of the Arctic Island of Kolgujew. With the exception of one doubtful case, all Dick tests were negative. Diphtheria and scarlet fever had never been reported on the island. Swabs were obtained from the throats of 168 persons, and from the noses of 93. No diphtheria bacilli were isolated, and hemolytic streptococci were found in only four swabs.

The careful work of Milam, Smillie and Burky[13, 14] gives a partial explanation as to why infectious diseases are rare or unknown in isolated primitive communities, yet excessively common in similar racial groups who live in contact with civilization. They state: "In general, the same types of organisms were found in the naso-pharynx of persons living in isolated communities in the Tropics, in the Temperate Zone, and in the Arctic Zone."

Streptococcus pyogenes was rarely encountered by these investigators in the nasopharynx in the three communities, Virgin Islands, Alabama and Labrador, which they studied. This absence of *Streptococcus pyogenes* is apparently a characteristic of isolated populations. Further, the infections commonly asso-

ciated with this organism, such as scarlet fever, erysipelas, tonsillitis and puerperal sepsis, were rare in the areas covered by this study.

Milam, Smillie and Burky believe that the absence of these common diseases of civilization in isolated primitive groups is not due to natural or acquired immunity, but to the absence of virulent hemolytic streptococci in the community. They conclude that *S. pyogenes* is essentially an organism of civilization and industrial overcrowding.

Undoubtedly, Milam, Smillie and Burky have accurately recorded their observations. However, in view of other reports on the presence of the specific antigenic factors in the environment of primitive peoples, it is apparent that their deductions are not entirely correct.

Under natural conditions of diet such as exist in isolated primitive races and in breast-fed babies, the pathogenic hemolytic streptococci, diphtheria bacilli, virulent pneumococci, *S. odontolyticus* and other pathogenic organisms, as we now understand their morphology, are not normal members of the basal flora, and the individuals subsisting on natural foods remain free from the diseases caused by these bacteria. However, the presence of specific antibodies in the blood of primitive people leads to the belief that pathogenic organisms must exist in primitive environments in an unrecognizable and avirulent state. It is apparent that there is present in all individuals a mechanism which is operative not only to prevent the colonization of pathogenic bacteria within the body, but also to attenuate or "depathogenate" those that leap this primary barrier. This natural or autarcetic immunity mechanism is highly effectual in the natural state, but it apparently becomes inoperative or ineffectual when the modern diet, particularly refined sucrose and cereal, is consumed.[7] We have noted that when babies are taken from the breast, pathogenic organisms may make their appearance in the basal flora within a few weeks.[8]

AUTARCETIC IMMUNITY

Shortly after birth, many bacterial species can be found in the oral cavity. In breast-fed babies, the basal oral flora becomes rapidly stabilized and consists essentially of streptococci. Once this flora has become stabilized, while the baby remains healthy, it is almost impossible to artificially implant extraneous strains without changing the diet. Occasionally, pathogenic streptococci may make their appearance, but they are rapidly denatured, altered or eliminated from the basal flora. The basal flora of babies is characterized by the consistent absence of pathogenic streptococci. There are many forces acting within the local environment of the mouth that limit the constituent members of the basal flora and maintain them in a vegetative, nonpathogenic, saprophytic state. Some of these forces are well known and understood, while others and their method of action are but vaguely comprehended.

Both Torrey[15] and Rettger[16] have shown that quantitative differences can be induced in the basal flora by alterations in the diet; while we have shown that qualitative changes can be produced by similar methods.[8] The bacteria in the oral flora normally lead a competitive existence and restrict the free growth of one another. This normal antibiosis is best maintained by providing the bacteria with a diet which will support the growth of all the competing strains. Alteration of the diet may lead to changes in bacterial antibiosis.

We further know that vitamin A and the lysozyme of the tissue cells have a limiting influence upon bacterial growth. It is also well known that when the sun retreats toward the south, changes occur in the oral flora in the direction of increased instability and greater acid

producing potentialities. With the coming of spring, this is reversed and the flora grows in the direction of increased stability. There are similar effects from artificial exposure to ultraviolet light and the ingestion of cod-liver oil. While a complete explanation of the method of action of the ultraviolet rays and cod-liver oil is not available, it is apparent, at least in the case of the latter, that the effect is not secured through direct destruction of the organisms, but through an indirect action which alters the local environment of the mouth. In this action, the vitamin A of the cod-liver oil is probably of great importance.

Bloomfield[17, 18] who has exhaustively studied this problem of natural immunity, reports that foreign bacteria artificially introduced into the mouth are rapidly eliminated. He expresses the opinion that, except for the normal flora, bacteria do not as a rule grow freely on the mucous membranes of the mouth and throat, and that special conditions, either a local infection or a transient invasion, are necessary to account for the presence of foreign organisms.

Bloomfield found that the "normal" flora was not eliminated, but continued to flourish in the buccal secretions following scrubbing, washing or copious irrigation, which rapidly eliminated adventitious organisms. He concluded that any organism which persists on a normal mucous membrane for more than a few hours must have a biologic relationship to the mucous surface; otherwise, it would be removed as a foreign particle by the normal eliminative mechanism.

DOLD-WEIGHMANN PHENOMENON

The work of Dold[19] and Weighmann[20] has recently cast much light not only on the significance of this normal oral bactericidal and bacteriostatic mechanism, but also on its method of operation. These authors showed that normal human saliva contains factors that not only will prevent the multiplication of certain pathogenic organisms, but often will also kill them within a few hours. Virulent diphtheria bacilli not killed by contact with these normal salivary constituents are almost invariably transformed into avirulent types.

Weighmann and Koehn[20] found that these transformed "mutants" will breed as apparently pseudodiphtheric organisms for at least ten transplants in an ordinary medium.

The presence of these "inhibins" or "bacteria-transforming enzymes" in normal saliva has been confirmed by a study of salivary inhibition and transformation of numerous other bacterial species. Wehrse,[21] for example, found that, in the presence of normal human saliva, hemolytic streptococci are often killed in from five to six hours and, if not killed, are almost invariably transformed into the non-hemolytic variants.

Pesch and Damm[22] report a similar bactericidal and transforming action on Type I and Type II pneumococci. Ignatius[23] demonstrated similar "inhibins" in normal nasal secretions, but was unable to demonstrate them in nasal discharges from patients with colds.

The "inhibins" in normal saliva are more or less completely removed by Seitz filtration, are non-diffusible through animal membrane and are destroyed quantitatively by heating saliva to 56° C. and maintaining it there for thirty minutes.

Bibby, Hine and Clough[24] write:

> The evidence suggests that, although the potency of different salivas may vary in their antibacterial effects, they all affect the same type of organisms without regard to the state of health or the immunologic reactions of the patient. In other words, determination of the effect of the saliva would seem to be primarily a determining of the basic bacterial flora of the mouth.

Muhlenbach[25] has recently demon-

strated that this salivary inhibition is due chiefly, if not entirely, to the growth in the saliva of the normal salivary streptococcus. Washings of a blood-agar culture of salivary streptococci produce an inhibition identical to that secured by whole saliva. In contrast to the streptococci, the other members of the basal oral flora cause no such inhibition.

In conjunction with Muhlenbach's studies, the early observations of Marmorek[22] have renewed interest. This author found that a broth filtrate in which streptococci had been grown was inhibitory to further growth of that strain as well as to other strains of human origin. He concluded that there was but one streptococcus of human origin. Similar antagonistic materials were described in 1927 by Besredka[27] as "streptococcal antivirus."

By the cooperation of many factors, varied and multiple, the oral cavity obtains an effective antibacterial mechanism which, under natural conditions, mechanically eliminates, "depathogenates," transforms or kills pathogenic organisms.

In 1912, Walker[28, 29] suggested that variation in biologic function depends on the more recent habitat of the streptococcus. He instances the remarkable uniformity of reaction in streptococci freshly isolated from the mouth, and it is unlikely that all streptococci which gain access to the cavity are, when first taken in, of one and the same type. Walker concludes that these streptococci, after a time, come to conform to the *Streptococcus salivarius* type, or types, owing to the special circumstance of their environment.

It is believed that the normal flora of breast-fed babies, and others on a natural diet, is composed of organisms which, although originating from human sources, have become so modified by the autarcetic forces operative in the saliva that they constitute separate and, in some cases, distinct species. Under natural conditions, the organisms composing the basal alimentary flora exist in a state of perfect parasitism and are nonpathogenic for the host.

It is apparent at the present time that the majority of the bacteria are in a constant state of flux, which is expressed both functionally and morphologically. Whatever state a given organism is in at the moment is largely dependent on its immediate previous environment. While there are certain forces which drive bacteria into involution and a vegetative existence, there are other forces which drive them in the direction of evolution and increased pathogenicity.

In 1927, Friedemann and Deicher[30] showed that the formation of toxin is not invariably the characteristic of scarlatinal streptococci, but appears to be spontaneously lost as the streptococcus in the buccal cavity becomes converted into a green variety, and can be artificially destroyed by acriflavine hydrochloride and sodium taurocholate with a similar green transformation. It is not, however, finally destroyed by these means, but may potentially persist in the substance of the bacteria, for toxic hemolytic organisms can be obtained from green atoxic streptococci by animal passage.

In 1928, Zlatogorov and Derkatch[31] reported that filtrates of lingual mucus of scarlet fever patients do not contain streptococci, but do contain an activating principle which is capable of transforming atoxic into toxic strains.

GRIFFITH PHENOMENON

In 1928, Griffith[32] demonstrated that it was possible to transmute a smooth Type I pneumococcus, via the noncapsulated rough variant, into smooth Type II and Type III pneumococci by growing them with a heat-killed smooth strain of these types.

Cantacuzene and Bonciu (1926-1927)[33, 34] found that the sterile pharyngeal exudate or urine from scarlet fever patients confers specific agglutinability upon non-scarlatinal streptococci grown in it. Other unrelated organisms also acquired this specific agglutinability. Transmissibility of this acquired agglutinability was observed in eight generations of *B. typhosus* and *B. coli,* while streptococcus cultures retained it through more than thirty passages.

In 1923, Walker[35] reported the development of mucoid colonies of streptococci from material secured from a case of experimental empyema in a rabbit. This mucoid form, in contrast to the normal strain, was highly pathogenic for mice. Walker is of the opinion that the characteristics of so-called *Streptococcus epidemicus* are temporary and that virulence increases with the acquirement of this form of growth by an ordinary hemolytic streptococcus. This fact is believed to have an important bearing on the epidemiology of "septic sore throat."

Sanfelice (1928)[36] is of the opinion that *Staphylococcus pyogenes aureus* plays the same rôle in human smallpox that streptococci do in scarlet fever. He is of the opinion that *Streptococcus hemolyticus* in scarlet fever as well as *Staphylococcus aureus* in smallpox are vectors of a filterable virus with enzymatic properties.

At the twentieth French Congress of Medicine in 1929, Professor Cantacuzene maintained that there is no scarlatinal streptococcus that is differentiable from other streptococci, and that the existence of a special virus must be assumed, of which the streptococcus is the transmitting agent.

It is now established experimentally that bacteria under natural conditions undergo spontaneous variation in virulence. It is further established that rough variants can be transformed into smooth virulent strains by being grown in the presence of bacterial fractions of the virus type which in themselves are incapable of independent growth without the presence of living cells. Type specificity thus derived is transmissible, as is the ability to synthesize this "stimulating fraction" in subsequent generations.

Under natural conditions, there has evolved in the alimentary tract a basal flora which is in perfect harmony with its environment. It is vegetative and lives in close biologic relationship to the mucous membranes of the host. Bacteria respond to the perfect nutritional, chemical and biochemical environment by developing in the direction of increased stability, increased resistance, progressively lessened pathogenicity and, eventually, absolute vegetation.

One of the chief causes of bacterial evolution, mutation and the development of pathogenic variants, and probably viruses, is an adverse chemical or biochemical environment.

It is apparent that the human organism, within comparatively recent years, has come in contact with a disastrous environmental factor with which it has had little previous evolutionary experience, and with which it is unable to compete.

Before discussing the nature of these environmental factors which favor bacterial evolution, we wish to briefly discuss the mechanism of microbic variation.

ARKWRIGHT-DE KRUIF PHENOMENON

Modern systematic investigation of the subject of bacterial variation begins with the classical work of Baerthlein[37] (Hadley, 1927), Arkwright (1921)[38] and de Kruif (1921-1922).[39] Baerthlein was the first to demonstrate clearly that, in many bacterial species, various colony types are closely correlated with other highly characteristic features of the in-

dividual organisms constituting the colonies.

Dawson[40, 41] presented evidence that the variation pattern of pneumococci corresponds to that exhibited by a wide variety of other bacteria.

The studies of many investigators have shown that at least three chief variant forms may be recognized among bacterial species. These forms have been designated by the terms M (mucoid), S (smooth) and R (rough). We have shown that the variation pattern in *Streptococcus salivarius* is similar to that exhibited by pneumococci and the hemolytic streptococci, as well as numerous other bacteria.[8]

From our observations, we are led to believe, in agreement with Hadley,[42] that the fundamental significance of this phenomenon is of a reproductive nature and that it concerns a "generative mechanism quite different from simple binary fission in the traditional sense."

While, occasionally, strains of bacteria are encountered which, with present methods, cannot be "jarred" from their stability, it would appear that, in the majority of cases, most individual bacterial cells must be considered to contain in various proportions S, M and R elements. The S, M, R variation is continuous rather than discontinuous and is reversible at all stages. It is the mechanism whereby bacteria can rapidly adapt themselves to a changing environment and undergo rational evolution.

While spontaneous variation does occur in bacteria, the process can be greatly accelerated by adding to the substrate various inhibitory substances such as salt, phenol, immune sera, bacteriophage, sugars and chemicals and by continued use of antiseptics. It has long been known that growth in the presence of sugars would lead to alterations in bacterial metabolism and to evolutionary changes.

Kuhn (1912)[43] states that the streptococci in the presence of fermentable sugar adopt a saprophytic or "herbivorous" metabolism, while in the absence of sugar, they adopt a parasitic or "carnivorous" metabolism.

Stevens and Koser (1919)[44] studied carefully the relationship of sugar fermentation, acid production and growth to hemolysin production by hemolytic streptococci. They conclude:

> Therefore the principal factor in the inhibition of haemolysin production by the carbohydrates studied appeared to be a change in the metabolism of the streptococci whereby more carbohydrate and less protein was utilized, so that although growth was much increased, proportionately less haemolysin was produced.

Pryer (1925)[45] reported that he was able to produce mutation in *Streptococcus scarlatinae* by growth on peptone-agar containing 10 per cent sucrose.

Oerskov (1930) and Oerskov and Poulsen (1931)[46] have reported that certain non-hemolytic streptococci produce a polysaccharid, resulting in relatively large mucoid colonies, when grown on 2 per cent sucrose-agar and, to a lesser extent, on raffinose.

Sherman[46] states that as far as his experience goes, all strains of *Streptococcus salivarius* which form mucoid colonies on sucrose-agar ferment inulin and raffinose.

Further, cultures which produce the mucoid material from sucrose and raffinose do not produce it from the following carbohydrates and combinations, though all of them are fermented: glucose, fructose, galactose, maltose, lactose, inulin, glucose-fructose, glucose-fructose-galactose, fructose-maltose, fructose-lactose, and glucose-inulin. Sherman's studies indicate that this mucoid material is a fructosan.

Dawson[41] has recently reported that the addition of glucose and sucrose to blood-agar plates would greatly increase

the growth of streptococci in the mucoid state.

We have shown that the characteristic and striking difference in the flora of the saliva obtained from breast-fed babies and that of the majority of civilized adults, when streaked on a sucrose-containing medium and incubated forty-eight hours, is the absence of the mucoid streptococcal form from the plate of the baby and its presence on the plate of the adult. We have pointed out that it is possible to convert the low-acid-producing vegetative streptococci of the infantile flora into high-acid-producing mucoid streptococci characteristic of the adult flora by growing them in the presence of sucrose. Streptococci which fail to coagulate milk in primary isolation acquire the ability to coagulate plain milk by growth in the presence of sucrose. This property is retained and transmitted through many generations.

In commenting upon the significance of bacterial evolution, Topley and Wilson[47] say:

> Taking the experimental evidence as a whole, it would seem to accord with the view, expressed by many epidemiologists, that variations in the character of the parasites are of major importance in the spread of human infections, and that an outbreak of disease may be initiated by the evolution, or importation of an "epidemic strain" of the causative organism.

SUMMARY

1. Under natural conditions, the body has a mechanism which eliminates, transforms or kills pathogenic organisms.

2. Within recent years, civilized human beings have encountered an environmental factor which reduces the effectiveness of the bactericidal and bacteriostatic mechanism of the saliva.

3. Refined sucrose is probably the most important environmental factor which has interfered with functioning of the autarcetic immunity mechanism, forced bacterial evolution and saturated civilized communities with pathogenic organisms.

4. It is suggested that the high incidence of scarlet fever, diphtheria, dental caries, appendicitis and other diseases of civilized man might be explained by the difference, bacteriologically, which exists between modern and primitive communities.

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SURGICAL CONSIDERATIONS IN THE CHILD PATIENT

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THE infant is born into the world without thoughts or inhibitions on any subject. He is a human organism and probably is equipped with a few primitive natural instincts. He has no inherited consciousness or instinctive feeling of fear. It is only as the child grows older, with environment and training affecting him, that shyness and fear appear and, all too frequently, in spite of conscientious training, become ingrained as a part of his nature.

A statement that the existence of timidity in the child's nature is due largely to the natural instincts of the mother appears sound. The major function of the mother is protection of the young, and the essence of protection is a caution akin to fear. Indeed, the installation of fear in the child is a mother's natural means — undoubtedly without purpose of lasting effect—of insuring the child's avoidance of danger. Throughout the early years of existence, pain and fear of pain have played a considerable part. His experiences with minor pains, with childish hurts, with treatments by the physician and with other incidents of his development, with the fears implanted in early childhood, make timidity and fear natural elements in the child's nature.

Observations pertaining to surgery for children may well be prefaced by a consideration of the foregoing remarks concerning the matter of fear and the child's attitude toward the dental surgeon and dental surgery. The surgeon must bear in mind that he is dealing with a child, a child imbued with natural fears and inhibitions, and must at the outset, if he wishes to be successful, gain the child's confidence—his friendship if possible.

In the establishment of such confidence, the first contact with the dental surgeon plays a large part. Full-mouth roentgenograms are just as important for the child as for the adult. Furthermore, there is no easier way of developing a child's confidence than through such a painless procedure.

Preoperative considerations should also be kept in mind in dealing with children as well as with adults, since it is not uncommon to meet children with diabetes, heart lesions, a tendency to bleeding or an enlargement of the thymus gland. Children of any of these types are poor risks, and the advice of their physicians should be sought. The judgment of both physician and dentist should determine the extent of the surgical procedure, the proper medication, the type of anesthetic and the possible need of hospitalization, since many of these patients cannot be properly taken care of in the average dental office.

Preoperative care in acute and subacute infections is likewise highly important. A local anesthetic should never be injected into an acutely infected area. One should either establish drainage through the tooth or, at the stage of subperiosteal abscess, incise and drain.

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After drainage is established, the mouth should be kept clean by the frequent use of a mouthwash. A physiologic sodium chloride solution, in my opinion, is preferable.

If possible, one should avoid operating on a child who has a cold, and one should never operate on a patient who has a sore throat, fever or digestive disturbances. Premedication for the average child is not necessary, although in some cases it is highly desirable. This is especially true if the operation is to be of long duration or if a general anesthetic is to be used.

Alcoholic stimulants should never be used with children. It is better to use the bracing effects of aromatic spirits of ammonia. In administering the anesthetic, a 25-27 gage needle is usually the one of choice. It is always dangerous to give a general anesthetic to a child with an enlarged thymus. The thymus is a two-lobed body in the neck and thorax of an infant. It appears to be a true lymph gland, and is thought to affect growth. It begins to waste away about the second year and disappears at about the end of the thirteenth year.[1]

As Wolf has observed,

> Perhaps the term, the angelic child, best portrays the typically thymic constitution. It is beautifully formed, blue or brown eyes, has finely chiseled features, transparent cheeks, thin lips, and silk-like hair, shapely limbs, is narrow waisted and often beautifully alert mentally. The upper central incisors and laterals are likely to be small.[2]

In operating upon a child of any type, certain procedures should obtain. The field of operation should be walled off with cotton rolls or gauze packs to keep the flow of saliva from entering the wound. All tissues should be inspected, as a good blood supply to the part is the best assurance of tissue repair. The child's throat should always be packed. A tooth sometimes leaves the forceps and reaches a bronchial tube.

Fig. 1.—Cheilitis due to traumatism during mandibular anesthesia.

Fig. 2 (Case 1).—Left mandible showing follicular cyst involving angle and ascending ramus.

Many complications are prevented by postoperative care, both local and general. Especially is this true of children who have little resistance, such as the anemic, the undernourished and the tuberculous. After the operation, the child should eat easily digested foods and should partake of fruit juices in large amounts. If fruit juices are not available, the patient should drink considerable water and the bowels must be kept open. A mild cathartic may be prescribed; for example, petrolagar, 1 teaspoon; cascara sagrada, one-half to 1 teaspoon, or milk of magnesia, one-fourth

to one-half ounce. Any of these will suffice in the average case, although in certain cases more drastic cathartics may be necessary.

There should be no washing or other cleansing of the mouth for the first twenty-four to forty-eight hours. The child should be examined the second day after the operation, and at intervals thereafter if necessary.

If there is no rise in temperature, one may rest assured that there will probably be no complications. The patient should then be instructed to irrigate the mouth with a mild antiseptic solution or a physiologic sodium chloride solution. Hydrogen peroxide should not be used.

Because of the activity of the child, hemorrhage after extraction is not in-

Fig. 3 (Case 1).—Right maxilla, showing malposed cuspid and large cystic area displacing maxillary sinus.

frequent. This should be given immediate attention. The clots should be wiped out with a sterile piece of gauze or syringed with warm water. A pressure pack of sterile gauze is often sufficient to control a small hemorrhage. If such treatment does not control the hemorrhage, the wound should be packed with the end of a cotton roll dipped in snake venom.

Both heat and cold may be used to relieve pain and swelling. In the early stages of infection, cold packs are applied, since lowering the temperature of the part prevents extravasation of the elements of the blood, and thus reduces and frequently prevents incipient infections. If the infection is extensive, heat should be applied by means of compresses. This causes hyperemia, thereby increasing the number of leukocytes, and hastens the walling off and localizing of the infection, so that the area may be incised and drained.

Dentists should make it a rule not to perform an extraction for a child who is ill and whose resistance is low. An attempt should be made to build up the health before any dental surgical measures are undertaken.

The removal of deciduous teeth sometimes presents difficulty, especially "submerged teeth," which are frequently

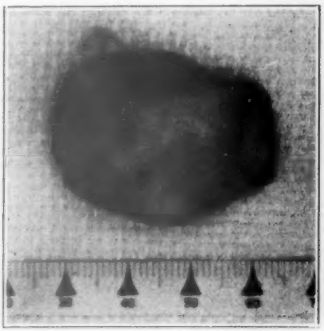


Fig. 4 (Case 1).—Nucleated mandibular cyst with adherent partially developed second molar.

ankylosed.[3] As Noyes has indicated, even the bone that lies between the deciduous and the permanent teeth, if not removed along with the deciduous tooth, may prevent the successful eruption of the permanent one.[4] Therefore, an extraction of this type should be carefully performed in order to eliminate both of these obstructions, until the permanent teeth take their places.

Another type of tooth that presents difficulty for the surgeon is the deciduous molar having its roots partially or completely resorbed near or at the neck of the tooth. With a little care, this type

can frequently be removed *in toto*. At times, however, the root and crown must be removed separately. Under block anesthesia, these roots can be removed with spoon excavators Nos. 14, 15, 16 and 17. The objection to the use of elevators in these cases is the fact that we may extract the permanent tooth in front or back of the deciduous root. After block anesthesia, the mother should be warned to keep the child from chewing the anesthetized lip or, by the next morning, the patient may develop a traumatic cheilitis. (Fig. 1.)

In child surgery, cysts of the jaws are encountered frequently. Many of the radicular and follicular cysts are small, but they may become large. As regards

Fig. 5 (Case 1).—Posterior-anterior roentgenogram taken four weeks after operation; showing obturator in epithelized cyst cavity.

the possible origin of these types of cyst, I refer the reader to "Histopathology of the Teeth and Their Structures," by Kronfeld. Radicular cysts result from infection at the apex of a pulpless tooth. They may, or may not, have an epithelial lining, which is believed to develop from fragments or remnants of Hertwig's sheath. They are most frequently found at the end of a non-vital lateral incisor. Stafne comments:

> In rare instances, epithelial-lined cysts of the jaws probably develop from retained deciduous roots. The absence of evidence of such roots in the roentgenogram of cysts of obscure origin does not necessarily rule them out as an etiologic factor, because they may not be of sufficient size to be seen or they may have been completely resorbed either prior to, or after, the formation of the cyst. It is possible that at least some of the epithelial islands found in the jaw, particularly those in the region of the premolar teeth, are those which at one time were associated with the roots of the deciduous teeth.[5]

Traumatic cysts generally occur in young patients. When found in older patients, there is always a history of trauma dating back to a time when the bone was young and soft.[6]

"They are analogous to those non-epithelium-lined cysts of long bones

Fig. 6 (Case 1).—Left mandible one year later (July 29, 1938); showing complete regeneration of cystic area.

which have been believed to result from the formation of hematomas following trauma."[6]

Thoma,[7] as quoted by Ivy and Curtis, believes that "the decomposition of the fibrin causes an irritation which leads to resorption of the cancellous portion of the bone with the formation of a cavity."[8]

Usually, the patient gives a history of trauma with moderately painful swelling of the bone at the point of injury. Havens, of the Mayo clinic, states that "evacuation of the contents of the cavity

usually is all that is necessary to bring about a cure."[6]

A report on median anterior maxillary cysts by Meyer is of interest. A study of 600 cadavers, as published by Meyer, reports one such cyst in every sixty-six specimens. Meyer also states that in 332 roentgenograms of children under 14, he found only fairly definite shadows indicative of a cyst in but three instances.[9] These cysts are found above or partially between the root ends of the upper central incisors. They seldom give rise to symptoms and usually are discovered during roentgenographic examinations. The treatment is surgical.

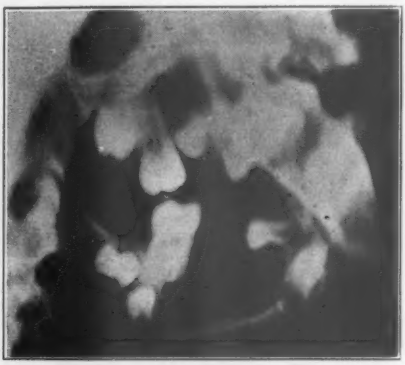


Fig. 7 (Case 2).—Right mandible; showing follicular dentigerous cyst of second premolar displacing tooth to below erupted permanent first molar. The inferior dental canal lies along the inferior border of the mandible.

COMMENT

Roentgenograms, both intra-oral and extra-oral, are absolutely essential in child surgery. If the whole area cannot be seen on the intra-oral film, it is necessary to have an extra-oral film. All teeth that can possibly be saved in these surgery cases should be saved. Any case that shows signs of malignancy should receive x-ray therapy.

The foregoing remarks have been confined to a few observations which seem to be of major importance in the broad field of child surgery.

REPORT OF CASES

CASE 1.—B. M. J., a girl, aged 7, on examination, July 16, 1937, showed extensive maxillary hyperplasia and poor oral hygiene. The mandibular left first molar was in an area of indurated swelling with slight external deformity. A roentgenographic examination, posterior-anterior, right and left oblique and stereo right lateral, revealed an area of rarefaction involving the body of the left mandible, extending from the region of the bicuspids backward and upward almost the full length of the ramus. Only a rim of solid bone remained, outlining the lower and posterior margins. (Fig. 2.) At the beginning of the cystic area, the first permanent molar showed an alveolar process almost resorbed. In the depth at the angle of the jaw was a partially developed second molar tooth. There are no demonstrable signs of a third molar. Normal eruption of the cuspid and bicuspid was demonstrable. The cuspid had not yet erupted and the deciduous tooth was above it. The right side was normal. In the right maxilla, there was a malposed, unerupted tooth beneath the margin of the orbit and the right nasal bone, surrounded by an area that is translucent and cystic. (Fig. 3.)

Fig. 8 (Case 2).—Case seventeen months after operation; showing eruption of second molar.

The roentgenographic findings in the left mandible were characteristic of follicular or dentigerous cyst, although adamantinoma was to be carefully ruled out by histopathologic study.

July 17, 1937, an operation was performed on the mandible under procaine anesthesia, the mandibular deciduous second molar and first permanent molar being removed. An extensive incision was made anteriorly of the ramus. A large dental cyst (probably folli-

cular), with an adherent partially developed second molar, was also removed and the wound packed with vaselin gauze. (Fig. 4.)

July 19, as the condition was satisfactory, the pack was removed. It was very foul and there was profuse bleeding. The wound was irrigated with metaphen and repacked loosely. The temperature was 100.4° F.

July 20, the condition was improved. The wound was irrigated with metaphen and a gauze pack inserted. The temperature was 100° F.

July 21, the condition was improved. The area was irrigated with metaphen, and dressed with zinc oxide and eugenol. The temperature was 100° F. The treatment was continued until August 11, when a wax obturator was inserted. (Fig. 5.)

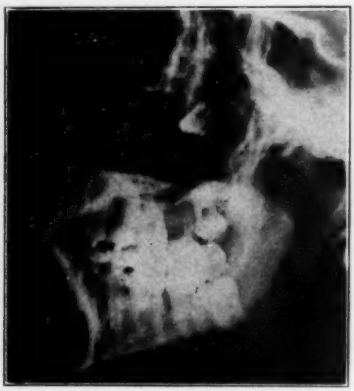


Fig. 9 (Case 3).—Left maxilla; showing follicular dentigerous cyst of maxillary third molar. The partially developed third molar lies immediately below the floor of the orbit.

September 3, the cavity was closing rapidly. The obturator was replaced. The maxillary right cuspid was partially developed and directed anteriorally under the right inner canthus, with a large follicular cyst.

October 8, an operation was performed under procaine anesthesia. A buccal labial flap was laid from the right central incisor to the right permanent first molar and the cyst exposed intra-orally through a cryptic bony shell. The cyst had expanded to involve the entire sinus, being about 4 by 2.5 cm. The entire cyst wall and cuspid were removed intact. The cyst contained a mass of yellowish, flaky material. The wound was packed with vaselin gauze. The immediate condition was good.

October 9, the patient had had no pain, but was listless. She had had a hemorrhage during the night. The area was irrigated with metaphen and repacked with vaselin gauze. The temperature was 100° F.

October 10, the condition was good. The patient had had a good night. There was no pain and slight edema was noted. The wound was irrigated and repacked. The temperature was 98.6° F. Treatment was continued until November 1. The cavity, which was completely lined with epithelium, was irrigated, and a modeling-compound obturator was placed in the cavity.

Fig. 10 (Case 4).—Bilateral tooth in tooth: maxillary left and right lateral incisors both showing chronic alveolar abscess. Below: Extracted teeth.

The patient was seen November 13, November 27 and December 18, when the cavity was irrigated and the obturator adjusted. The cavity had now closed to an area about 1 cm. wide by 2 cm. deep.

February 12, 1938, the case was again seen. The mandibular cavity had completely closed, and the maxillary was reduced to a small cavity. The obturator was discontinued.

July 29, both cystic cavities were closed. There was slight bulging of the right cheek,

but no apparent maxillary infection. A roentgenogram of the dental area showed that the mandibular area was well calcified (Fig. 6), and the right maxillary also was regenerated. The right maxillary first bicuspid was erupting, but root development was probably arrested.

September 16, the condition was satisfactory.

Laboratory Report

Microscopic section revealed a rather loose connective tissue wall with squamous epithelium forming the lining of a large cyst cavity. The cyst wall was quite vascular

Fig. 11 (Case 5).—Tumor of palate, clinically fibroma; histopathologically, mixed tumor.

and, in one area, it showed considerable round-cell infiltration and was lined with squamous epithelium. Within it, there was a cellular débris, also some large flat cells each with a large pale degenerated nucleus. These cells appeared to be squamous. A section taken from a small whitish projection into the cyst wall consisted of a rather solid connective tissue-like structure. The laboratory diagnosis was dentigerous follicular cyst, of benign origin.

CASE 2.—A. N., a boy, aged 8, seen December 2, 1932, in the right mandible had a large cystic area extending from the deciduous first molar to below the first permanent molar. There was no pain. Roentgenograms showed that the mandibular right first bicuspid was partially developed and directed distally, with the crown in the cystic area. The entire cancellous bone was destroyed, and the swelling extended both buccally and lingually from the alveolar ridge. The permanent second bicuspid had been displaced and pushed down directly under the first permanent molar. Little bone remained and there was great danger of spontaneous fracture. (Fig. 7.)

Abscesses on the deciduous first and sec-

Fig. 12 (Case 6).—Large pedunculated tumor at junction of soft and hard palate near tuberosity.

ond molars had been previously removed.

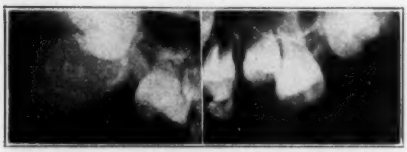
The diagnosis was extensive follicular cyst of the lower right first bicuspid, with secondary infection. The patient was operated on under procaine anesthesia. An incision was carried buccally from the lower first bicuspid to the lower first molar, and the first bicuspid and first molar were removed. A large amount of purulent fluid was removed. A wide buccal and lingual opening was made by the Partsch method and packed with iodoform gauze, which was changed on the third day to vaselin gauze.

This was continued for three weeks. The cavity was now completely lined with epithelial tissue. A wax obturator was made, and the patient was told to return every ten days.

February 25, the cavity was about two-thirds closed. A roentgenogram at this time revealed some bone regeneration.

June 15, the cavity was entirely closed and the contour of the mandible was normal. An extra-oral roentgenogram revealed good bone development and the lower second bicuspid and second molar were erupting normally. This case was last seen April 14, 1934. A roentgenogram at this time revealed regeneration of bone and a satisfactory alveolar ridge. (Fig. 8.)

CASE 3.—R. M., a boy, aged 16, seen November 3, 1939, had an acute abscess in the left maxillary molar region. As the teeth were normal, the abscess was lanced. Later, the maxillary second molar was removed because of a necrotic pulp. The sinus was



A B

Fig. 13 (Case 6).—Left: Tumor; showing bony center surrounded by thick, dense fibrous wall. Right: Postoperative appearance, three years later. The second permanent molar has erupted.

opened by nasal puncture because of extensive suppuration. Later, a flap over the second molar broke down. The wound through the second molar area to the sinus had free drainage. The teeth were free from caries. A vitality test of the left maxillary molar was normal. The first and second bicuspids were vital. In the anterior-posterior angle of the sinus just beneath the floor of the orbit was a follicular cyst, which subsequently had become infected. (Fig. 9.)

A buccal flap was laid back, starting at the first bicuspid and extending above the tuberosity. The first molar was extracted. A large opening, apparently into the sinus, was found. The septic crypt wall was removed, also the partially developed third molar. The entire tuberosity was destroyed by pressure resorption. The wound was closed immediately with a dermal suture. The immediate condition was good. The patient was referred to a rhinologist for a nasosinus window.

November 13, the patient was feeling well. The wound was closing, but was still open to the cyst cavity. The suture was removed and the cavity irrigated. The parents were advised that the flap probably would break down, but that no attempt to close the wound should be made until all inflammation was arrested.

November 22, the condition was definitely improved. The cyst cavity and sinus were apparently not connected. The tract was irrigated with an antiseptic and astringent, and is now (December 1, 1939) kept open. The condition is good. The sinus-to-cyst

Fig. 14 (Case 7).—Right mandible; showing cystic area in third molar region.

cavity is nearly closed. This case was seen at intervals of thirty days, and, March 25, the patient was advised to have dentures made.

CASE 4 (Fig. 10).—J. S., a girl, aged 14, seen August 23, 1939, presented a *dens in dente,* with a suppurating sinus above both maxillary right and left lateral incisors. There was congenital absence of the maxillary and mandibular right and left second bicuspids. Under procaine infiltration, a labial flap was made. Extensive granulomatous cystlike growths were revealed about the roots.

The left root was bulbous, with resorption. The area at the center led to a pulp filled

with dense granulating tissue. The right root was dark and slightly larger than normal, with an apical granuloma. The crowns of both teeth were noncarious.

There was strangulation of the pulps due to invagination of enamel-simulating odontomata, with gangrene and subsequent hematogenous infection.

CASE 5.—M. McF., a girl, aged 14, seen August 1, 1938, presented a hard non-inflamed, non-painful swelling in the palate opposite the right second molar. (Fig. 11.) The swelling had been first noticed about a year previously. The growth was about 2 cm. in diameter and of the same depth, hard and slightly movable, but not fluctuating.

The tentative diagnosis was fibroma.

Operation: Under procaine anesthesia, a firm grayish egg-shaped tumor about 1.5 cm.

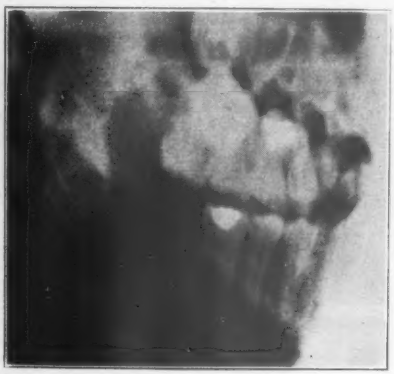


Fig. 15 (Case 7).—Postoperative appearance, six weeks later. At this time, the cavity was completely closed and there was beginning recalcification.

long was enucleated. The wound was closed with horsehair sutures.

August 5, the condition very good, with no edema. The suture was removed.

Laboratory findings: A mixed tumor was present with indications of tumor cells breaking through the capsule. The lesion was probably malignant, though clinically well encapsulated. X-ray therapy was recommended.

CASE 6.—M. C., a girl, aged 7, seen August 29, 1935, presented a large painless non-inflamed pedunculated growth adherent to the mucosa, lingually from the maxillary right first molar and very firm and dense. It was approximately 3 cm. in diameter by 4.5 cm. in length from base to tip and lying in close relationship to the tonsil. It was pale pink and the surface was smooth. A slightly congested area opposite the mandibular first permanent molar was due to trauma. (Fig. 12.) X-ray examination revealed a bony rounded tumor with a dense mucosa, about 5 mm. thick.

The tentative diagnosis was osteofibroma.

Preoperatively, 1.5 grains of barbital was given. Under procaine block anesthesia, a buccal and lingual incision was made through the mucosa around the tumor base. The tumor was freed and detached from the bony alveolar process by fracturing the exostosis back to the first molar region and extracting the deciduous second molar. A capsule of dense fibrous tissue was removed

Fig. 16 (Case 7).—Postoperative appearance; showing complete regeneration of bone one year later.

from the alveolus over the partially developed permanent second molar, which was exposed. The partially erupted first and second molars were not disturbed, but retention was problematic. (Fig. 13.)

Laboratory findings: An irregularly spherical mass about 4 cm. in diameter was apparently composed of a rolled-up, spinous-shaped projection containing a small isolated mass of bone with a plaque of bone at the base of the so-called spine. It was pure white and was very firm on section, bearing a smooth white tissue.

The mass consisted of loose connective tissue with small darkly staining nuclei.

Fragments from near the bone showed more nuclei of exactly the same type in proportion to the amount of connective tissue. The blood vessels were relatively few and were surrounded by an infiltration of lymphocytes. There was no epithelium, except at the mucous border; which rules out adamantinoma.

The diagnosis was osteofibroma.

The patient was last seen in the summer of 1939, when her condition was good. There had been no recurrence of the growth, and the first and second molars were erupting normally. (Fig. 13.)

CASE 7.—K. M., a girl, aged 19, seen February 8, 1940, had had no previous illness or complaint. The condition was discovered during routine examination. The intra-oral film in the region of the mandibular right third molar revealed definite signs of a cystic nature. The extra-oral films showed the complete outline of a cyst. The second molar had a deep cavity, but was vital. (Fig. 14.)

The diagnosis was radicular cyst.

Operation was performed under procaine anesthesia. No lining was found in the cystic cavity, which had a reasonably good bony outline, with evidence of hemorrhagic fluid, but not of a typical cystic nature. The wound was packed with vaselin gauze. This treatment was continued until February 26, when a wax obturator was inserted. The cavity was completely closed by March 20. (Figs. 15 and 16.) Undoubtedly, this was a traumatic cyst, although the patient could not recall receiving a blow or suffering any other injury to the jaw.

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REMOVAL OF IMPACTED TEETH AND FRACTURED ROOT ENDS

By Samuel Granof, D.D.S., Milwaukee, Wis.

TEETH of any type that are out of alinement with the other teeth of the maxillae or the mandible are termed impacted. They usually lie at an angle to the adjacent tooth. The impacted tooth may lean buccally, lingually, mesially or distally from the long axis of the teeth in the arch, or it may assume a buccolingual position in its entirety. Because these teeth have no function in the mouth, the spaces between the tissues and the teeth readily become areas of inflammation. Malposed teeth acting as foci of chronic inflammation or infection may be the cause of reflex pain, facial spasm, neuralgia, insomnia, muscular twitching, neuritis or arthritis, and sometimes may affect the vision.

CLASSIFICATION

Third molar impactions may be divided into three classes: (1) tissue impactions; (2) tissue and bony impactions, and (3) impactions in which the tooth is completely covered by osseous tissue.

In tissue impactions, the teeth are fully erupted, but have a covering of mucous membrane, of such tough, fibrous consistency that full exfoliation of the tooth is impossible. Often these teeth lie at a slight angle or parallel to the adjacent teeth. There is usually a break in the mucous membrane, permitting clinical observation of the tooth.

The second division is the tissue and partial bony impaction. In these cases, usually the tooth erupts part way through the mucous membrane, but, on retraction of the soft tissues, the bony obstruction can be observed. In this type of impaction, the tooth makes a pronounced angle with the adjacent tooth.

The third type of third molar impaction is one in which the entire tooth is covered with osseous tissue and is usually found to be lying at right angles to the adjacent tooth.

The first and second divisions of the mucous membrane and partial bone impactions can often be observed clinically, but the third type of full bony obstruction can be detected only in the x-ray film. The soft tissue impactions are the ones that we see most often, since they easily become areas of acute inflammation and pericoronal infection.

Unerupted cuspid teeth are frequently observed. They are of two types: (1) the impacted cuspid lying in the palate and (2) the unerupted cuspid lying buccally from the roots of the other teeth.

Impacted cuspids can sometimes be clinically observed by an elevation in the mucous membrane of the palate or in the mucobuccal fold, but most often will be disclosed in a roentgenogram.

The prime requirement in the procedure of removing impacted teeth is proper roentgenograms. No matter how easily an embedded tooth may be observed clinically, it is still essential to have the x-ray film at hand for the proper surgical procedure.

ROENTGENOGRAMS

No surgical measure should be at-

Read at the Thirty-Fourth Annual Meeting of the Central Wisconsin Dental Society, June 13, 1941.

tempted without x-ray pictures of the area in which the operation will be performed. This procedure cannot be disputed. The removal of teeth is difficult enough without operating in the dark. At least two or three roentgenograms should be taken of the impacted teeth that are to be removed.

In operating upon an impacted maxillary third molar, at least three roentgenograms should be taken. One is taken by directing the rays at a 30 degree angle to the film and should disclose the crowns of the teeth. The second film should be taken with the film in the area covering the third molar and the x-ray tube moved closer to the median line and a little above the roots of the teeth, with the rays directed distally from the third molar. This will disclose the palatal (or buccal) inclination of the tooth. The third film should be taken with the tube directing its rays from an area near the ear and slightly above the teeth. This will disclose the root formation.

The same number of x-ray pictures should be taken in mandibular third molar impactions. One film is taken in the regular manner, disclosing the crown of the tooth and the crowns adjacent to it. If this film reveals the entire root of the tooth, another film showing this area will not be necessary, but if the roots are not visible, a film should be made with the x-ray tube placed distally from the angle of the jaw at right angles to the film and transmitting its rays from the distal aspect of the tooth toward the mesial. This will disclose the formation of the roots. To obtain the buccal or lingual position of the tooth as it lies in the mandible, a film is inserted in the mouth over the third molar area and held in place by a finger. The patient's head is turned to either the right or the left, the position depending on which molar is to be removed, and the tube is lowered below the jaw and pointed at a right angle to the film.

For the removal of impacted cuspids, two roentgenograms are usually necessary. One is taken in the usual manner, through the area of the cuspid region. The other film is taken by inserting an occlusal film in the patient's mouth and having him bite down to hold it in place. The rays are directed at a right angle to the film from above the nose. This film will disclose the palatal or buccal location of the impacted cuspid.

Roentgenograms having been taken, the operator can develop the technic accordingly.

SURGERY

In removing an impacted maxillary third molar, an incision is made from the mucobuccal fold to the gingiva along the mesial aspect of the distal root of the second molar, then along the gingiva of the second molar distally to the mucous membrane, above the third molar and continuing over the incisal ridge, until the covering over the area of the tooth and a bit more distally has been incised. The incision over the third molar should be in the middle of the crown portion of the tooth. A small incision should be made in the gingiva on the palatal section so that this tissue will not tear during the blunt dissection from the maxillae.

With a periosteal elevator, the mucoperiosteum is bluntly dissected from the bone on the buccal side, and the third molar is usually exposed. If the tooth is covered with osseous tissue, the use of a chisel and mallet will remove it and expose the crown of the tooth. No attempt should be made to remove the tooth until the crown is entirely uncovered, as we are likely to break off the tuberosity and leave an ugly wound. By inserting a curved elevator between the crown of the tooth and the maxillae, with pressure distally and downward, the tooth can be exfoliated. Maxillary third molar impactions are usually of a membranous type.

Impacted mandibular third molars are the teeth most frequently requiring surgical removal. The flap, for this type of surgery, is made by an incision on the buccal aspect of the second molar, at a distance of about 3 mm. from the buccomesial angle of the second molar mesial root, downward to the mucobuccal fold. The incision is then continued along the gingiva distally to the second molar and distally midway between the lingual and buccal aspect of the retromolar area of the mandible to the lower border of the angle of the ramus and the mandible and a short distance upward along the ramus. This, when dissected with a periosteal elevator, will give sufficient space for the removal of any type of impacted mandibular third molar.

The amount of osseous covering of the tooth to be removed will depend on the type of impaction present. Sufficient bone should be removed to allow for complete exfoliation without too much stress being required. It is the use of too much pressure that will sometimes result in fracture of the mandible. Utmost care and precaution should be displayed at all times. Contraindications for the removal of embedded teeth are often present. Impacted teeth of the first and second class, when in an acutely infectious condition should not be removed until the acute infection has subsided and the patient's health has improved. Pericoronal infection, the most frequent disease of these teeth, should be treated before surgical measures are taken.

Impacted cuspids are usually found in the palatal side of the maxillae. In their removal, an incision is made along the median line from the central incisor distally to an area well past the crown of the tooth. The mucous membrane is then incised from the central incisor past the second bicuspid along the gingiva. The mucoperiosteum is then dissected backward and held in place by a suture, passed through the mucoperiosteum and attached to one of the molars. This will keep the field of operation clear and the operator will not be hindered by a constant flapping forward.

The x-rays having disclosed the location of the tooth, it should not be difficult for the operator to locate it after the membranous covering has been removed. The osseous tissue covering the cuspid should be removed well beyond the crown of the tooth and from the greatest curvature of the crown. The tooth can either be removed by sectioning off the crown with a chisel and then removing the root, or else it can be removed in toto. Care must be exercised not to remove or loosen the teeth in the vicinity of the cuspid. The exfoliation of the tooth can be started with an elevator, and completed by grasping the crown of the tooth with sharp-nosed forceps.

Should the cuspid be found on the labial aspect of the maxillae, an incision is made from the mucobuccal fold to the gingiva well toward the median line and passed along the gingiva to about the area of the second bicuspid, and the mucoperiosteum retracted.

ASEPSIS

The removal of impacted teeth in unhygienic mouths may be followed by infection. It is therefore good procedure to make certain that the area of operation is placed in as hygienic and aseptic condition as possible. The physical condition of the patient should also be considered. The removal of impacted teeth is a delicate operation, necessitating the same knowledge of asepsis, surgery and the physical condition of the patient as operations in any other part of the body. It is of paramount necessity for the dental surgeon to know of certain existent conditions involved in these operations. A patient requiring surgical treatment and apparently in poor health should be thoroughly ques-

tioned as to his physical condition and, if necessary, his physician should be called in for consultation.

No impacted tooth should be removed without a complete set of roentgenograms. Postoperatively, the patient should be instructed to apply icepacks to the involved areas for twenty-four hours, these to be followed by warm compresses. An analgesic should be prescribed and the patient instructed to return for postoperative treatment.

The question often arises: Is it always necessary to remove impacted teeth? Different opinions are held regarding this question. W. H. G. Logan, of Chicago, in recent research, found that fully embedded teeth do not show infection or inflammation despite the presence of bacteria. Dr. Logan concludes his article with this summary:

> From the normal appearance of the tooth follicle and from the total absence of any inflammatory reaction in or around the completely embedded teeth, it appears that such teeth merely represent a continuation of the preeruptive state.
>
> In the light of our present knowledge, the profession should be warned against expecting benefits from the removal of completely embedded teeth in patients suffering from systemic diseases that are held to be influenced or caused by focal infection.
>
> In spite of the foregoing statements and summary findings, it is held that embedded teeth in radiographically normal structures should be removed when it is thought that they are accountable for or influencing certain neurologic phenomena. In exceptional cases it would appear that one may be justified in removing embedded teeth when all other fields have been freed from focal infection without benefit and it is the belief of the physician in charge that the health of the patient will be improved by such procedure.

Quoting from D. J. Aubertine's article in THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION for December 1936:

> The dental profession has been too prone to allow the impacted third molar to remain if the patient is not complaining of any untoward symptom at the time. If it has been definitely decided that it would be impossible for these teeth to erupt normally in the arch, it is better to remove them at this time, rather than later in life, when the roots are fully formed.

From the foregoing quotations, we can conclude from a conservative standpoint that at least 90 per cent of all embedded teeth should be removed, and can be with beneficial result to the general health of the patient.

REMOVAL OF FRACTURED ROOT ENDS

The removal of broken-off root ends often is a difficult task, when one wishes to preserve as much bone structure as possible in a maxillary ridge. This is especially true in edentulous cases, in which a smooth even ridge is so essential to a well-fitting, serviceable denture.

The usual procedure is to retract the tissue in the area, remove the overlying process of the tooth socket and then exfoliate the root. This method leaves a definite uneven indenture in the ridge, which is a hindrance to good prosthesis.

The method here employed is a definite and simple surgical procedure which, when completed, leaves an even ridge and is therefore indicated in all cases for the removal of broken-off root ends where access to the area is not too difficult.

A roentgenogram of the broken-off root is absolutely necessary. The incision is made over the incisal ridge above the root and is continued down along the center of the root adjacent to the broken-off fragment. The tissue is retracted with a periosteal elevator and the area is exposed.

The depth of the root socket to the top of the broken-off root is measured with an instrument, and to this is added the length of the root fragment, which is obtained from the x-ray film. The combined measurement will indicate the exact depth of the tooth socket.

The combined measurement is now applied to the buccal aspect of the tooth socket. An opening is then made with a surgical bur about 1 mm. beneath the lowest point of the measurement.

A curved instrument is placed in the hole and pressure is exerted upward. If there is no hindrance, such as an exostosis, the root will be easily pushed upward through the greater portion of the tooth socket. The root is thus exfoliated without destruction of the buccal wall.

The mucous membrane is then returned and a suture is placed near the incisal ridge. When healing has been completed, no indication remains of the removal of a broken-off root end.

212 West Wisconsin Avenue.

DENTAL AUTONOMY: A POLICY OF ISOLATION

By V. H. KAZANJIAN,* D.M.D., M.D., Boston, Mass.

IN reviewing the development of dentistry, it is apparent that much of its progress as a profession has been independent of outside influences, and its efforts have been exceptionally creative of means to meet its own problems. This all indicates that there has been a struggle, and, in becoming strong, the profession has become vulnerable; for self-sufficiency blurs the possibility of cooperation, while domination stifles initiative and independent thought. Neither condition is desirable.

It would be wise for dentistry to remember that it has earned an identity which it is prepared to defend should the occasion arise. It merits an independence of thought and action, and as an entity could not be absorbed by medicine, even if either dentistry or medicine so desired. With neither profession advocating such a policy, both should realize—and dentistry in particular—that autonomy and isolation are synonomous and selfish in thought as well as impractical in the long run.

The trends in dental education have gradually become definite: better fundamental education in anatomy, histology and subjects elucidating the nature of the human tissues; scientific progress in surgery and the use of anesthetics; technically proved mechanical procedures instead of the trial-and-error methods of the past, and new methods serving children in the preventive and corrective fields. A complete review of the curriculum, unnecessary here, would but add proof that isolation is vanishing and that it would even require a struggle to maintain it. The increasing attention to the cultural and scientific background of the dental student as expressed in the dental school entrance requirements is but a tacit confession that broader fields lie ahead. The educational plan of the Harvard School of Dental Medicine is a crystallization of today's trends. It might have been expected and should be welcomed. It is a step and not a jump.

The Harvard School will endeavor to train specially qualified young men for broad opportunities in dental medicine, and this cannot be accomplished by isolation. The doors of medicine, dentistry and all sciences must be thrown open

*Professor of plastic surgery, Harvard School of Dental Medicine.

in equipping the student to meet his responsibility to society. Harvard lays no claim to originality and undertakes this plan with no idea of being universally followed. In taking counsel with others and in possibly guiding others in this field, Harvard is upholding its belief that cooperation is essential and that autonomy is impractical.

Archibald MacLeish, in the *Atlantic Monthly* of May 1941, in an article entitled "The Next Harvard," says:

> The swing toward specialization and isolation of knowledge seems to have come to a temporary stop in our generation . . . commerce between the various fields of knowledge is difficult, as difficult almost as commerce between nationalistic states . . . a development which attempts to deal with this difficulty by making provision for experts in different fields to work together on problems common to them all. . . . The techniques of cooperative scholarship are continually discovering new areas for exploration between the old boundaries. . . . That the University stands at the opening of a new period of great promise requires no argument. The facts speak for themselves. That the University's scholarship, which is the University's lifeblood, is full and vigorous is also manifest. It is difficult to think of any period in Harvard's history when more, and more hopeful, work has been blocked out by abler and more courageous minds.

Dentistry as a calling, or as a trade, has roots deep in history. It received some notice, but no recognition, as early as the sixteenth century. Its modern progress, crystallized into really noteworthy accomplishments, started late in the nineteenth century, and has continued without interruption.

Medicine shares with dentistry the title of "doctor," which was first bestowed by universities during the twelfth century, and which was used to denote a learned man in any profession. The title "Doctor of Medicine" was bestowed for the first time in 1329 by the College of Asti, in Italy. Several practitioners in France in 1622 received the title of "Surgeon Dentiste," although the records here are not entirely clear.

During the early years of the nineteenth century, although there appeared to be an increasing consciousness of the need for trained dentists, irregular systems of apprenticeship to private practitioners were the sources of information available to interested students. Of the pioneer dentists who were educated at all, many enjoyed the advantages of a medical education, which appeared to better fit them for their work. Dentistry frequently encountered contempt from the medical profession; was obliged to create its own facilities for education, to write its own books and to invent its own nomenclature. Both Hayden and Harris attempted unsuccessfully to interest medical education in the training of dentists. One of the replies to their request was that the subject of dentistry was of little consequence, and thus justified unfavorable action. Rough treatment, no doubt; but possibly as a consequence of frustration, dentistry has amply earned its place in the professional sun.

N. C. Keep, the first dean of the Harvard Dental School, and its first professor of mechanical dentistry, favored a united medical and dental education, and advocated the degree of M.D. for dental practitioners.

The Harvard Dental School, founded in 1867, was the first dental school connected with a university, and the eleventh to be founded since the Baltimore College of Dental Surgery received its charter in 1839. Of its first faculty of eleven men, two, Luther Shepard and Samuel Horn, had dental and medical degrees. One, Porter, is recorded as having no degrees, while the other eight held M.D. degrees only. Since that time, medical as well as dental education has passed through several changes successfully.

Reviewing the history, it is not difficult to comprehend why dentistry has traveled a solitary educational road, envious of its own hard-fought-for progress, and, occasionally, knocking at the door of medicine and receiving scant welcome. If blame must be fixed, medicine was the less tolerant, the more shortsighted. The separation, and this was the stone wall of prejudice, cost medicine a needed knowledge of problems of the mouth, and committed dentistry largely to a second-rate program of training in fundamental sciences, which deferred too long the biologic awakening of which dentistry is even now just aware. It resulted in years of struggle, of bitter disappointment and of failure on the part of dental educators, and undoubtedly prompted the remark of a well-known teacher, in response to a plea for higher training for dentists, "How much education does a man need to pull a tooth?" The separation went farther than this, and dentistry has largely risen above its early failures, and has carved out of the rocks of opposition an honorable standing in the educational fields.

Medicine, with a strange absence of logic, created an educational no man's land around the mouth and the teeth, and it was medicine's ignorance of oral conditions which was responsible for the ruthless years of mass extractions during the second and third decades of this century. That trained minds now view this problem differently does not mean that the current has reversed itself for no reason, or that the pendulum, having reached the limit of its arc, is now swinging back of its own momentum. There must have occurred a union of thinking minds, where the past, if it has ever been really known, is now forgotten, and where there can be a union of objectives, as well as of thought. To repeat MacLeish's words, "The techniques of cooperative scholarship are continually discovering new areas for exploration between the old boundaries." In truth, dentistry has been admitted to the company of educated men.

The Harvard School of Dental Medicine, honorably succeeding a noted institution, has encountered opposition, chiefly expressed in terms of fear. A widespread opinion prevailed that dentistry had reached a definite place in its struggle upward, at which point it was first to be sacrificed to, and then to be submerged by, medicine. Even were this fear justified by incidents of the past, dentistry is far too strong to be absorbed by any other profession, and this very strength guarantees its position in the future. The prospect is for union and not for submergence or absorption, for progress and not stasis, and for a unified government. The accomplishments of the past, the trends of the present and the cooperation of the two professions in the future will end a tradition of partial isolation, and create an educational structure meeting present-day and future needs and satisfying its critics.

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OCTOBER *Editorial Department* 1941

OPPORTUNITY—OBLIGATION

THE philosophic French adage *noblesse oblige* imposes upon those in positions of preferment an obligation of service in some measure commensurate with the degree of preferment.

In the present emergency, the dental profession, upon its own request, has been placed in a position of preferment where it can render a special and valuable health service to the Army, the Navy and the public, and, with this opportunity for service, there goes an obligation that is morally binding by virtue of the professional obligations that one assumes in choosing dentistry as a life work.

The government has long since extended to the dental profession the opportunity to serve the Army and the Navy through a health service that is designed to forward and sustain, in a very material sense, the usefulness and effectiveness of the military arm of the government; and it has intrusted this opportunity for service to us at our own request.

The development and perfection of the Dental Corps of the Army and Navy as an indispensable health service are the culmination of a long, tedious and, at times, trying effort of the dental profession exerted in the spirit of professional service and in the desire to serve humanity.

The Dental Corps of the Army and the Navy have run the gamut of vicissitudes, political and otherwise, in the profession and in the Army and Navy. We have progressed from a volunteer, non-commissoned contract service with a status little above the level of the laborer to a practically autonomous commissioned corps, which, though ancillary to the medical corps, has the opportunity to prove its worthiness of a still higher status in the military health service.

We have, through the years, endeavored to impress the military arm of the government with the desirability and necessity for adequate health service, and now an almost tragic experience resulting from dental neglect, as shown in the large percentage of dental deficiencies in draftees, has added the final convincing proof of the necessity of dental health service in the Army and the Navy, as well as in industry and for the laity. We have long contended that the cumulative results of neglect of the mouth is an economic waste that exacts an enormous toll in loss of teeth, in suffering and in loss of human life that could readily be prevented by dental service.

Since the inception of the movement to provide dental health service for the Army and the Navy, ample opportunity has arisen on many occasions for the dental profession to justify by act the establishment of the Dental Corps, and the profession has measured up to its opportunity in every instance. But the opportunity that has just arisen for additional justification, as the result of enlarging the scope of the draft, is one that will test the ingenuity, the ability and the facilities of the dental profession to provide the additional service thus required. Even so, the record of the past warrants us in predicting that the dental profession will prove equal to the task; and so sure are we of this eventuality that we welcome this opportunity with confidence.

The revelations of increased dental disabilities in the young manhood of the country over the proportions shown in the first World War are just what should be expected. Indifference from every quarter regarding mouth health could but result in increase in mouth disease. Though somewhat disheartening, this result offers another and broader opportunity for proof of the value of dental service.

The increased need and the constantly increasing scope of the work of the Dental Corps call for extra effort, if not sacrifice, on the part of dentistry. The large percentage of men who have been rejected for army duty because of dental disabilities has been interpreted, in some quarters, as a reflection upon the dental profession. We, however, are not in the least inclined to accept such an interpretation. We attribute

this increase in dental disability entirely to the failure of the public to appreciate and to accept our educational efforts toward mouth health.

'Tis an ill wind that blows no good, and we are hopeful that the ill wind of increased dental disease will blow the truth of the benefits to be gained from mouth health service to every quarter of our country.

The possible increased demands upon the physical manpower of dentistry have, at times, given us some concern, and although the new demands will tax our resources, it is encouraging to note here that the new survey of the facilities of dentistry being made by the Selective Service System auxiliary of the American Dental Association is showing that the number of practicing dentists in the United States is much larger than we had thought. Many were of the opinion that there are only about 60,000 actively practicing dentists in the United States, whereas the questionnaire survey promises a return of nearer 70,000. If this proves to be the case, the situation is not so serious as we had believed.

This new light on the number of practicing dentists, however, does not warrant any encroachment on the sources of supply, and the government, through the Selective Service System, has shown no disposition to interfere with the dental educational program. In fact, the government has made provision for not disturbing students and prospective students who have indicated their intention of pursuing dental study.

Our President, Dr. Wilfred H. Robinson, has pointed to many signs and indications of a bright future for dentistry in its second or "new century of dental progress," and we are enthusiastically hopeful that the manner in which the dental profession is approaching this new test of our professional stamina and morale will be an added factor in brightening the silver lining that is at present behind the war-clouded skies of dentistry.

In a former issue of THE JOURNAL and on a somewhat similar theme, we expressed an equally exuberant enthusiasm for the future of dentistry; and one of our contemporaries interpreted it as comparable to the small boy's whistle in the dark to bolster up his courage. We disclaim such a motive for our exuberance on that and on this occasion and proclaim it to be a *bona fide* expression of optimism based on the courage of confidence in the future of the dental profession.

Now, in an intensely practical age, made more so by the stark realities of threatened war, when the value of every branch of science and knowledge is judged by its utilitarian relationship to advancing civilization, dentistry has the greatest opportunity ever offered it to justify its

fitness for survival as a contributory factor in the progress of civilization on the basis of its public health relations.

It is highly desirable and is becoming increasingly urgent that dental service be made available to all classes, as have the benefits of other phases of the healing art, and, as we see it, it is a problem the solution of which is distinctly related to the dental educational policy of the future and one that will have a determining influence upon the future of dentistry as a branch of the healing art.

The obligation of meeting the demands of the present emergency constitutes a challenge to the patriotism of the profession and its loyalty to the Army and the Navy, the government and the public; and the manner in which we meet this challenge will, in large measure, be a factor in the determination of our future status.

Let us all join heartily in a professional "all out" for an adequate mouth health service for the Army, the Navy, industry and the public!

DEATH OF DR. JESSE D. WHITE

IT is with exceeding sadness that we announce the death of Dr. Jesse D. White, of St. Louis, Mo., which occurred on September 16. An obituary will appear in a future issue of THE JOURNAL.

BIBLIOGRAPHICAL

Your Teeth. Their Past, Present and Probable Future

By PETER J. BREKHUS, B.A., D.D.S., Professor of Oral Diagnosis, School of Dentistry, University of Minnesota. Cloth. 247 pages. Price $2.50. The University of Minnesota Press, Minneapolis. 1941.

IT need hardly be said that any one familiar with the work of Dr. Brekhus in the clinic, classroom and research laboratory would expect to find in "Your Teeth" a treatise of unusual scope and authority—a mature, able and valuable record of scholarly investigations. And such a work it is: factual, critical, constructive, founded upon that patience and exact regard for truth which must always be the cornerstone of science. Its reference material will enable the inquirer to pursue many phases of dental science and history or an hypothesis by consulting the cited independent authorities in certain fields.

But Dr. Brekhus here reveals himself in another rôle no less appropriate to his purpose—the rôle of humanitarian; and, in that character, enlivens his text with such humor, such shrewdness of observation, analysis and deduction with reference to human behavior that the average dramatist should be filled with envy of his powers, and the average reader filled with delight to discover an exposition of important facts which is so easy to read. The contents of the book are selected and arranged in such a way as to hold attention until all pertinent facts are assembled, and thus prepare the mind to accept the logical measures for conservation of the teeth which are proposed in the final chapter.

The author's first task is to put aside mis-

leading propaganda and inconclusive theories as to the cause and prevention of dental caries, and to show that its incidence is definitely increasing among civilized people whose general health may be excellent. A well considered presentation upon periodontoclasia impresses the reader with the writer's comprehensive grasp of this subject. Chapters which follow treat of dental abnormalities, dental embryology, dental history and pathology from prehistoric times, and the beginnings of scientific dentistry with the European Renaissance. In Chapter 7, "The Teeth of Other Races," Dr. Brekhus begins the solid building-up of his case for immediate, intensive effort to avert the dental impotence which seems to threaten civilized man, who is so seldom called upon to use his teeth as powerful and necessary tools. In "Dental Disease and Dental Adaptation Among Animals" (Chapter 8, which includes a most timely and constructive study of comparative dental anatomy) occurs one of the most telling humorous passages, following an account of the remains of many species of tooth birds found in western Kansas. A similar purpose is served by the mention of edentulous mammals and the resemblance of an anteater's jaw to the weak profile of a toothless human being. Facetious allusions pervade the entire narrative, which, of course, serve to invite and retain the interest of the reader.

Chapter 10, under the heading "Some Biological Factors in Our Loss of Teeth," summarizes the material of earlier chapters, with added emphasis on the influence of advancing civilization in altering the function of the jaws and teeth, and so leads up, in effect, to a final recommendation (on the eve of promulgation at the outbreak of World War I) that the universal care of children's teeth become, like elementary education, a recognized social and economic responsibility of the state, this being at present the one proved way to limit the action of dental caries among the whole population. Hope for the future lies in soundly based research, whence "great and universal benefits" may eventually arise if the work is fostered and encouraged in proportion to its importance. Throughout the entire volume, Dr. Brekhus sets forth in a convincing way the values and importance of dentistry as a division of health service. The book, in effect, through admirable simplicity of diction, is an appeal for more and better dentistry for children.

A vigorous and authoritative foreword is supplied by Prof. Irvine McQuarrie, commenting on the practical viewpoint and the timeliness of Dr. Brekhus' book, the appearance of which coincides with an "amazing resurgence" of professional and popular interest in dental problems and should further command the attention of benevolent foundations and institutions of higher learning which are awakening to the challenge of unchecked dental disease.

ALBERT L. MIDGLEY.

Dietetics

By ALIDA FRANCIS PATTEE. Graduate, Department of Household Arts, State Normal School, Framingham, Mass., Formerly Instructor in Dietetics, Bellevue Training School for Nurses, Bellevue Hospital, New York City, etc. Ed. 22. Cloth. 868 pages, including appendix of food values. Mount Vernon, N. Y.: A. F. Pattee, 1940.

THIS complete volume on practical dietetics is suitable for either elementary professional or lay instruction. A successful attempt has been made to present in simple fashion the entire field of the science of dietetics. To this end, the volume describes the types of foods and their respective functions, the processes of digestion, the vitamins and their rôles in human nutrition and other pertinent material, to provide an adequate background for the more technical aspects of diet planning. A feature of the book is the discussion of the types of diet particularly suitable for the treatment of certain diseases. Each of a number of diseases is considered separately, and recommendations as to frequency of feedings and types of diets advised are presented. These sections are prepared by physicians who are specialists in the particular field covered, and the latest in diet therapy is described. The final section of the book is devoted to the preparation of the diet for both the sick and the well, and here one finds a collection of recipes. An appendix which is quite complete lists the composition of average servings of foods, including the vitamine content. Each chapter concludes with a list of questions covering the content of the section. This volume is a modern, complete text on dietetics and can be highly recommended for classroom work and as a reference.

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President's Page

"1941 — BEGINNING A NEW CENTURY OF DENTAL PROGRESS"

THE second one hundred years of dental progress will have its official birth with the opening of the Eighty-Third Annual Meeting of the American Dental Association, which will be held in Houston during the last five days of October of this year.

It is a known fact that primitive man practiced dentistry. Records show that prehistoric man suffered from tooth decay, and it is only logical to surmise that those who had this form of disease attempted by some method to obtain relief.

Ancient writings abound with data regarding the practice and progress of dentistry. Records show that even before the birth of Christ, the Hindus, the Romans and the Greeks had some form of dental practice. But it was in the City of Baltimore, one hundred years ago, that modern dentistry was born. What has been accomplished by American dentistry these past one hundred years is, without question, due entirely to the influence of organized dentistry, and especially is the influence of the American Dental Association felt in this advancement of the profession.

It was particularly fitting, Baltimore being the cradle of modern dentistry, that the conclusion of the first one hundred years of dentistry's advancement should have been celebrated in that city under the guidance of the American Dental Association.

This year, in the city of Houston, Texas, the second century of modern dentistry will be inaugurated. What the future pathway of dental progress will be is of paramount importance to every practicing dentist. It is quite possible that the solution to this all-absorbing problem regarding what the Second Century of Dental Progress will bring about may be found in the Scientific and Health Exhibits which will be seen in Houston's large Coliseum.

Here, every advancement in dental research and dental science will be shown. There will be many displays and exhibits presenting facts regarding diseases of the oral cavity, operative dentistry, prosthetics, oral surgery, anatomy, pathology, bacteriology and many other fields, as well as displays of microscopic slides, roentgenograms, transparencies, case models, drawings, charts, etc. This section will merit the study of every dentist who attends the Annual Meeting.

PAN-AMERICAN DAY

This year, during the Annual Meeting, there will be a new activity, to be known as Pan-American Day. Following out the idea of our government's good neighbor policy in South America, invitations were issued to the dental organizations of all the Latin-American states, as well as of Mexico and Canada, requesting their members to visit the Houston meeting. These invitations were issued with the thought that our brother dentists practicing in countries other than the United States might be induced, while visiting our meeting, to participate in the program.

We are hopeful that such cooperation and interchange of ideas will not only promote an international feeling of good-will among the dentists, but will also give an added impetus to our professional advancement.

THE GENERAL SESSIONS

Three outstanding speakers have been secured for the general sessions. It is with pleasure that I here announce the acceptance by A. E. Rowlett, of Leicester, England, of an invitation to come to the United States as the guest of the American Dental Association and address the General Session on Thursday evening. Dr. Rowlett will have a message of extreme interest.

THE ANNUAL MEETING

The Local Arrangements Committee, comprised for the most part of dentists who reside in the city of Houston, has spared no efforts to make the Eighty-Third Annual Meeting one that the visiting American Dental Association members will long remember. It is a well-known fact that the citizens of Texas have a world-wide reputation for hospitality, and the dentists of Texas are no exception to this rule.

For nearly a year, the various committee members have been organizing and arranging a program that will meet the requirements of a most exacting membership. Nothing has been neglected, no responsibility or assignment has been too unimportant or too difficult to receive the utmost consideration. The scientific part of the program will be complete; the entertainment unique. Every effort has been made to insure that the visiting guests shall receive the utmost in hospitality and comfort while in the city of Houston.

ACCOMMODATIONS

Houston has many beautiful and modern hotels. The largest and

most luxurious of these hotels is the Rice, a structure of one thousand rooms, occupying a complete block in the heart of the city. This hotel will be the center of activities, having been designated as official headquarters.

The demand for reservations from those who expect to attend the meeting has far exceeded all official expectations. Already five of the leading hotels have been filled. But as the city of Houston has more than thirty first class hotels, those of our members who contemplate attending may be assured of comfortable accommodations at a reasonable cost. The heavy preconvention demand for reservations gives rise to the prophecy that the Eighty-Third Annual Meeting will be the largest in the history of the American Dental Association.

Wilfred H. Robinson.

COUNCIL ON DENTAL THERAPEUTICS

TEEL—NOT ACCEPTABLE FOR A.D.R.

[Report of the Council on Dental Therapeutics of the American Dental Association, authorized for publication.]

In response to numerous requests for information, the Council published brief comments on the status of liquid dentifrices in the light of the facts then available (J.A.D.A., 27:953, June 1940). In this report, it was pointed out that liquid dentifrices are not new inventions; that the use of the products may be associated with staining of the teeth, but that liquid dentifrices might be used to advantage in those cases in which the cementum is exposed through gingival recession.

The last point is one of some interest and will be appreciated by all members of the profession. It should be clearly understood, however, that there are not, as far as the Council is aware, published reports showing the comparative effects of liquid dentifrices and currently used tooth pastes and tooth powders on exposed cementum and dentin. Certainly, it would require a long and painstaking investigation to determine just what effect dentifrices do exert on all parts of the teeth exposed to their action under the usual and ordinary conditions of use. The investigation would be made more difficult by reason of the fact that the possible effect of use of a given dentifrice a few years or even months ago might not now be characteristic of the product because of changes in composition. Nevertheless, the Council's statement concerning the possible sphere of usefulness of liquid dentifrices is based upon a reasonable assumption. Council consultants, including Wright and Fenske (J.A.D.A., 24:1889, November 1937) have indicated by means of laboratory studies that the prolonged use of insoluble ingredients commonly employed in dentifrices may wear away

dentin and cementum when these structures are exposed. The exact clinical applications of such findings are not known; nor is it known exactly what the clinical effects of using various types of toothbrushes or methods of brushing the teeth may be.

The situation is summarized in A.D.R., Edition 6, page 113, in these words: "However, until more information is available, the Council will refrain from drawing definite conclusions concerning the abrasive effect of dentifrices on enamel, dentin or cementum."

The dentifrice Teel (Procter & Gamble) is stated to have the following composition:

2% sodium alkyl sulfate, 9% glycerin, 8% sugar, 2% sodium chloride, 31.7% alcohol (by volume), an edible gum, conventional flavoring materials commonly found in dentifrices, a coloring agent approved by the U. S. Department of Agriculture, the balance, water.

In recent advertisements which may properly be termed "scare advertisements," the public is informed in effect that the teeth will be irreparably damaged by the use of leading tooth pastes and tooth powders. For example, the firm states:

Millions are injuring their teeth—Be Safe! Brush your Teeth the Liquid Way. . . . of 8 leading dentifrices tested, liquid dentifrice alone avoids this injury to teeth.

As far as the Council is aware, these statements have not been substantiated by adequate published evidence.

The firm also asserts that Teel is an excellent cleansing agent and that there is "Beauty in every drop." Claims of this sort do not take into account the substantial percentage of persons whose teeth assume a yellow to black shade when this product is used. The Council has received sufficient reports from members of the profession to indicate that this characteristic of Teel is quite well recognized by practicing dentists. Apparently, it is not known just how much Teel aids in cleaning the teeth of other users.

Evidently, the firm knows that Teel is not an effective dentifrice. This is indicated by the following statement found in the last and obscure portion of a recent advertisement:

If, however, you feel that your teeth need an abrasive scouring, at least occasionally, we suggest that you brush them with salt and soda once or twice a week and still use Teel twice a day and thus enjoy its amazing benefits.

Just what the "amazing benefits" might be is not entirely clear. Nor is it clear why salt and soda should not be used exclusively in preference to Teel. After all, these simple ingredients aid in cleaning the teeth when Teel does not.

The Council's rules make provisions for legitimate trade puffery. It is to be expected that a manufacturer will be partial to his own product. It must be recognized, however, that the public welfare dictates that serious deficiencies in products or contraindications to their use shall be clearly and frankly presented. In this the firm has failed. Moreover, its statements regarding the efficiency of Teel as a dentifrice have not been substantiated by adequate evidence. The firm's disparaging remarks concerning the harmful properties of competing dentifrices are unwarranted and unfair because of the lack of available evidence. If the firm has evidence with respect to harmful or dangerous properties of competing products, that evidence should be made available to all interested parties and not be first provided for the use of untrained and technically incompetent writers of advertising copy.

In the light of the foregoing, Teel is declared unacceptable for A.D.R.

A copy of the rules that govern the Council in the consideration of articles will be sent on request.

HAROLD L. HANSEN, *Secretary*.

PRELIMINARY REPORT ON ALUDROX AND MAGMA OF ALUMINA AND KAOLIN (DENTAL)

ALUDROX and Magma of Alumina and Kaolin, Dental (John Wyeth & Brother, Philadelphia) have been presented to the Council for consideration. These preparations are intended for use as adjuncts to instrumentation in the treatment of periodontal diseases.

According to information supplied by the firm, the composition of the products is as follows:

Aludrox	
Glycerine	6.240 gm.
Flavor (oil of peppermint, methyl salicylate)	0.025 gm.
Sodium benzoate	0.500 gm.
Aluminum hydroxide gel q.s. ad	100.000 cc.
Magma of Alumina and Kaolin, Dental	
Kaolin	20.000 gm.
Flavor (oil of peppermint, methyl salicylate, saccharin)	0.034 gm.
Sodium benzoate	0.500 gm.
Aluminum hydroxide gel q.s. ad	100.000 cc.

The referee has examined the laboratory and clinical evidence advanced on behalf of these preparations. He has concluded that the available evidence does not serve to establish the usefulness of the products in the treatment of periodontal diseases. Consideration of problems of nomenclature in this case was deferred. The Council concurred in the referee's recommendations.

The firm has informed the Council that, pending collection of further evidence, it will cease active promotion of Aludrox and Magma of Alumina and Kaolin, Dental, and supply only the existing demand.

This report on the present status of Aludrox and Magma of Alumina and Kaolin, Dental, in the light of the Council's rules, is being presented because of numerous requests for information from members of the dental profession.

HAROLD L. HANSEN, *Secretary.*

CORRECTION

THROUGH an oversight, an error appeared in the article "Nutrition and Dental Health, with Special Emphasis on Periodontal Relationships" (J.A.D.A., 28:1524-1532, September 1941). On page 1530, under "Conclusions," the fifth sentence should be corrected to read:

"The primary cause has been found to be failure to consume a diet quantitatively and qualitatively adequate."

ACCEPTED DENTAL REMEDIES

The Council on Dental Therapeutics of the American Dental Association announces the inclusion of the following articles in the list of Accepted Dental Remedies.

Anesthetics—Local*

Procaine HCl 2%, Epinephrine 1:25,000-Oradent Brand: Each cubic centimeter is stated to contain procaine hydrochloride, 0.02 gm.; epinephrine, 0.00004 gm.; disodium phosphate, 0.0006 gm.; sodium chloride, 0.0045 gm., and

sodium bisulfite, 0.0020 gm.; in distilled water. Marketed in 1.5 cc., 2 cc., 2.5 cc. and 3 cc. ampuls; 2.4 cc. (approx.) and 1.8 cc. (approx.) cartridges, and 1 and 2 ounce bottles.

Procaine HCl 2%, Epinephrine 1:50,000-Oradent Brand: Each cubic centimeter is stated to contain procaine hydrochloride, 0.02 gm.; epinephrine, 0.00002 gm.; disodium phosphate, 0.0006 gm.; sodium chloride, 0.0045 gm., and sodium bisulfite, 0.0020 gm.; in distilled water. Marketed in 1.5 cc., 2 cc., 2.5 cc. and 3 cc. ampuls; 2.4 cc. (approx.) and 1.8 cc. (approx.) cartridges, and 1 and 2 ounce bottles.

Procaine HCl 2%, Neo-Synephrin 1:3500-Oradent Brand: Each cubic centimeter is stated to contain procaine hydrochloride, 0.02 gm.; neosynephrin hydrochloride, 0.000285 gm.; sodium chloride, 0.0045 gm.; disodium phosphate, 0.0006 gm., and sodium bisulfite, 0.0020 gm.; in distilled water. Marketed in 1.5 cc., 2 cc., 2.5 cc. and 3 cc. ampuls; 2.4 cc. (approx.) and 1.8 cc. (approx.) cartridges, and 1 and 2 ounce bottles.

Manufactured by the Oradent Chemical Company, Long Island City, N. Y.

Admission of an article to the list of Accepted Dental Remedies does not imply a recommendation. Information regarding the rules and work of the Council will be sent on request.

HAROLD L. HANSEN, *Secretary.*

*A. D. R. Ed. 6, p. 38.

BUREAU OF PUBLIC RELATIONS

AMERICAN DENTAL ASSOCIATION PUBLIC HEALTH INSTITUTE FOR TEACHERS

THE American Dental Association Public Health Institute for Teachers will be held in the Auditorium of the San Jacinto High School, Holman and Austin streets, Houston, Texas, October 28 at 3 p.m., with the following program:

Opening remarks: F. C. Elliott, Chairman, Committee on Public Relations.

Greetings: Wilfred H. Robinson, President of the American Dental Association.

Welcome: Harlan H. Horner, secretary of the Council on Dental Education.

Welcome: Walter H. Scherer, general chairman, Local Arrangements Committee.

Introduction of Ernest A. Branch, president of the American Association of Public Health Dentists; Ralph L. Ireland, president of the American Society of Dentistry for Children, and Edward Taylor, director of Dental Health of the Texas State Department of Health.

"How the School Teacher Can Create More Interest in Dental Health." F. C Cady, U.S.P.H.S., Lexington, Ky.

"The Dentist and the Class Room Teacher." Konrad Lux, Waco, Texas.

"Texas Teachers and Dental Health Education." D. B. Harmon, education coordinator, Texas State Department of Health, Austin, Texas.

TENNESSEE'S POSTGRADUATE DENTAL EDUCATION PROGRAM

By P. E. BLACKERBY, JR.,* A.B., D.D.S., M.S.P.H., Nashville, Tenn.

IN 1939, the Tennessee State Dental Association formally approved a program submitted by the Tennessee State Department of Public Health. Under the leadership of Oren A. Oliver, dental member of the Tennessee Public Health Council, advisory body to the Tennessee Department of Public Health, a program of postgraduate dental education was inaugurated for the practicing dentists of Tennessee. The title "Postgraduate Seminar" was adopted. An advisory committee was appointed from the state association to make arrangements, select instructors and organize the district societies for the project.

Dentistry for children was chosen as the theme for the first postgraduate seminar, and Ralph L. Ireland, professor of children's dentistry, University of Nebraska, and W. J. Pelton, past assistant dental surgeon, U. S. Public Health Service, were selected as instructors.

Instead of a one-day "refresher" course, as previously employed in a number of other states, a comprehensive, five-day program of instruction was planned for the dentists in each of nine geographic centers of the state. A five-day course of study, including lectures, motion pictures, lantern slides, group discussions and office demonstrations, was arranged for each of three geographic centers in East Tennessee, to be continued on the same day each week for five consecutive weeks. At the end of five weeks, the program was moved to the three selected centers in Middle Tennessee, to run on Mondays, Wednesdays and Fridays, respectively, of each week for the second five weeks' period, as in the previous district. Thus, after fifteen weeks, the five-day program had been presented to nine class centers in the three main geographic divisions of the state, with a special class arranged for colored dentists at Meharry College. Table 1 shows the class schedule for the various sections of the state.

The daily program included lectures for from two to three hours; table clinics for one hour, and office demonstrations for approximately two hours. In the larger centers, out-of-town class members were given preference for the afternoon office demonstrations, which were repeated on the following morning (Tuesday, Thursday, Saturday) for the local practitioners. In this manner, each dentist had an opportunity to secure five full days of instruction in dentistry for children, with a maximum travel of 50 miles (one way) and at a loss of only one day a week from his office.

The program was financed jointly by the class members, who paid a registration fee of $5, and a grant from the Tennessee Department of Public Health. The total budget for the first annual seminar was $4,100.

Of the 903 licensed dentists in Tennessee, 424, or 47 per cent, enrolled for the first year's course of study. Of the eighty-six Tennessee counties having one or more resident dentists, sixty were represented in the registration list. Of the dentists practicing in semirural areas (cities of less than 10,000 population), 53.3 per cent attended the seminar, while 43.2 per cent of the dentists in the larger cities participated. Of the 548 members of the state dental association,

*Director of dental hygiene, Tennessee Department of Public Health.

355, or 64.8 per cent, were registered; whereas 46, or 16.5 per cent, of the non-members were enrolled. In addition, fourteen out-of-state dentists, representing four states contiguous to Tennessee, attended the courses, and of the seventy-six colored dentists practicing in Tennessee, twenty-three, or 30.3 per cent, enrolled in the classes.

Certificates of attendance were awarded to those class members who attended at least four of the five days of instruction, and 373, or 85.2 per cent, of the enrollees qualified for these certificates.

Kanthak, of the University of Illinois College of Dentistry, and George B. Diefenbach, of the University of Louisville School of Dentistry, were chosen as instructors. A registration fee of $10 was charged for the second year's course, and 352 dentists enrolled in the various classes. A financial grant from the state department of public health completed the budget for the second annual program.

The third annual postgraduate seminar was conducted during the period July 14 to August 12, 1941. Hermann Becks, professor of dental medicine,

SCHEDULE OF CLASSES, FIRST ANNUAL POSTGRADUATE SEMINAR

		First Week	Second Week	Third Week	Fourth Week	Fifth Week
East Tennessee	Johnson City Knoxville Chattanooga	Monday Wednesday Friday	Monday Wednesday Friday	Monday Wednesday Friday	Monday Wednesday Friday	Monday Wednesday Friday
		Sixth Week	Seventh Week	Eighth Week	Ninth Week	Tenth Week
Middle Tennessee	Cookeville Meharry College Nashville Columbia	Monday Tuesday Wednesday Friday	Monday Tuesday Wednesday Friday	Monday Tuesday Wednesday Friday	Monday Tuesday Wednesday Friday	Monday Tuesday Wednesday Friday
		Eleventh Week	Twelfth Week	Thirteenth Week	Fourteenth Week	Fifteenth Week
West Tennessee	Jackson Union City Memphis	Monday Wednesday Friday	Monday Wednesday Friday	Monday Wednesday Friday	Monday Wednesday Friday	Monday Wednesday Friday

As a result of the favorable response and enthusiasm shown during the first year's seminar, the program has been established on an annual basis. In 1940, a second seminar, on the subject "Oral Diagnosis and Roentgenography," was organized and conducted throughout the state. A two-day program of instruction in the fundamentals of examination, diagnosis and roentgenographic technic and interpretation was offered in each of ten centers of the state, with three instructors assigned to the three grand divisions of the state, respectively.

Maynard K. Hine and Frank F.

University of California, served as instructor on the subject "The Application of Preventive Principles in Dentistry." Fifteen hours of instruction, including lectures, motion pictures, lantern slides, group discussions and individual consultations, were provided for the dentists in each of six geographic centers of the state. The arrangement of class sessions was established locally by vote of the district society, some centers having two full days of class work, others choosing to distribute the time over four consecutive evenings.

The registration fee for the third an-

nual seminar was set at $5, and an allocation of funds was again made by the Tennessee Department of Public Health. A registration of 352 dentists was shown for this year's course of study, and the enthusiasm and interest exhibited by the class members were at the highest level to date. Each district voted unanimously for a continuation of the program next year and urged that arrangements be made, if possible, for Dr. Beck to return to Tennessee in 1942.

Lay education activities by the various class instructors, including talks to civic and luncheon clubs, radio talks and newspaper publicity, have been carefully planned each year, in order that useful, up-to-date information on dentistry may be made available to the public as well as to the profession. Dental hygienists, dental assistants, physicians and public health workers have been invited to attend the courses of instruction as guests of the local dental societies. As a result, dentistry in Tennessee has been elevated to an unprecedented level, in the eyes of the public and of the other professions.

The excellent work of the state committee chairmen, Walter T. McFall, W. Wyatt Martin, and Leonard F. Pogue, and of the various state association officers and district chairmen, in organizing, planning and overseeing the postgraduate program in the various centers, is deserving of recognition and praise. The excellent cooperation of the state and district dental societies, the assistance provided by the Tennessee Department of Public Health and the Tennessee Public Health Council and the energy, ability and enthusiasm of the various instructors who have served the profession so well have contributed immeasurably to the present and future status of dentistry in Tennessee.

Postgraduate training and continuous study are responsibilities that the dental profession must assume if it is to maintain or raise its high standards of service. The experimental program that Tennessee has inaugurated has already demonstrated the possibilities which lie in a united, determined effort to provide programs of study for the practicing dentists at a minimum of travel and expense. The benefits to the profession are tremendous; the ultimate value to the public will be equally great, in improved diagnostic and preventive and therapeutic services rendered by the many dentists who have taken full advantage of the educational opportunities thus presented.

CHICAGO'S DENTAL HEALTH PROGRAM

By CARL GREENWALD,* D.D.S., M.S.D., Chicago, Ill.

THE organization and operation of Chicago's new dental health program represent a definite step forward in public recognition of the importance of dental care. For many years, it has been recognized that the status of dental health in large urban populations was such that the individual dentist and the dental profession could not cope with the situation to the satisfaction of the community or health authorities. Further, the distribution of dental ills among large indigent groups did not permit a significant evaluation of potential dental conditions in the private office or the partially supported clinics.

While it is commonly accepted that

*Chief, Dental Hygiene Unit, Chicago Health Department.

the incidence of dental ills in a large population group, such as Chicago, is extremely high, the number of people seeking treatment for these ills is far below 50 per cent of the total group. In the face of such conditions, public health officials deem it their responsibility to take up the slack with an effective dental program of their own. Chicago has done this, with notable success thus far.

In the past, it has been asserted that, from the standpoint of public health, a dental teaching program for children falls short in most respects, with the exception of teaching children to go to their dentists periodically and regularly. We can honestly teach that the filling of a tooth that has a slight defect will usually assist in the prevention of major dental defects. Similarly, small sums of money spent for prevention will save larger sums, which must otherwise be spent for extensive restorations.

The commercial publicized slogan "See your dentist twice a year" holds the answer to what we can hope to accomplish from a teaching standpoint. With good intentions, we have taught cleanliness, tooth exercise, diet and the dangers of intercurrent diseases and primary infections to patients—all with the idea of prevention in mind. Still, the true relationship of these conditions to caries is not understood.

An elaborate set of maxims, such as "The clean tooth never decays"; "For health, eat leafy vegetables and drink milk," and "Use of vitamin D prevents decay," was evolved. Theories regarding an excess of carbohydrates in the diet, abstinence from certain cereals, gum chewing, the presence of infected tonsils and a host of other conditions alleged to be the true cause of caries were injected in teaching programs. But we must admit, for the present at least, that the only sound and conservative dictum is "See your dentist twice a year."

Be that as it may, in a dental health program, the limitations of the dentist as a teacher must be realized and we must be satisfied to accept the educator's technic and the fact that there is nothing in the basic training of the dentist to qualify him to substitute for the educator in the field of modern education.

We are obliged to point out to the professional educator the scientific dental facts that are to be taught and the value of teaching these facts. This, in essence, is part of the Chicago school program. The educational and social agencies realize the need for a dental health program, and have requested the dental profession to investigate and inform them as to the present status of the program.

A program solely for the purpose of giving dental aid to the indigent group cannot be called a public health measure, but must be considered to be a single phase of emergency relief. Nevertheless, we cannot disregard our responsibility to society for the care of this group, and we must make every available effort toward the inclusion of this phase of health care in any dental health program.

The general status of dental health in a community as large as Chicago has been recognized to be far below the level which the dental profession would consider as adequate in accordance with the recent trends in preventive dentistry.

The existing condition is in no manner the fault of the individual dentist. Nor can organized dentistry be blamed. The existence of such a condition has long been recognized by the dental profession and the local dental societies.

It was impossible for the Chicago Health Department to cope with the situation with its limited staff and inadequate facilities. Hence, it became obvious, on the basis of the health department's dental hygiene unit appropriations during the past years, that more money and an increase in person-

nel were needed to conduct an efficient and workable program for dental health and preventive dentistry among Chicago's school children.

In full realization of these facts, the City of Chicago and the board of education applied to the Federal Government, through WPA, for aid in carrying through a dental health program. The request was met in February 1940, on the reasonable basis that the WPA would furnish funds for personnel, while equipment and supplies would be furnished by the City of Chicago and the board of education.

The method of procedure in the Chicago dental health program has been carefully worked out to allow maximum efficiency in treatment with a minimum of expense and duplicated effort. Dentists were selected on the basis of a competitive written examination and personal interviews by a personnel committee composed of leading educators in dentistry. An initial group of fifty dentists, in addition to the health department's regular staff of twenty-five members, began work in October 1940. The WPA supplied sufficient clerks and attendants to assist the dentists.

One part of the program is devoted to the determination of the dental status of every school child in the City of Chicago. The information recorded includes: specific teeth present or absent, deciduous and permanent; caries lesions: specific tooth and specific surfaces, including fillings to be replaced, fillings present, specific surfaces and specific teeth; status of occlusion; hypoplasia; gingivitis, and mouth habits.

The oral examination findings for each child are recorded on an individual examination chart, which is filled in by special code. This code is used to minimize clinical errors and to expedite the transfer of important information to the master card. From this master card, specific information is sorted out and correlated for statistical purposes.

After the examination, the child is given a card addressed to the parents or guardian, advising that the child has dental defects and urging the parent to take the child to the family dentist. However, if a family comes under one of the following indigent groups: family on relief; family registered with council on social agencies, and family with no source of income or a per capita income of less than $6 a week, the child is referred to the dental clinic located in or near the child's school. Treatment is limited to children from kindergarten to and including eighth grade.

In this manner, the child who, because of financial circumstances, cannot visit his family dentist is provided with dental care in accordance with the dictates of preventive dentistry until such time as the family can afford to pay a private dentist.

Careful records are kept for those children who receive treatment. Treatment consists of: silver amalgam fillings; cement fillings, if the tooth is to be retained for less than six months; silicate fillings for anterior teeth; emergency treatment for pain control; pulp capping, if indicated in deciduous and permanent teeth; extractions, conservative and simple, and prophylaxis and gingivitis treatments.

The clinics are located in the schools. They are well equipped and have modern dental units, chairs, cabinets, engines, etc. The supplies and instruments are of standard makes and are the best to be had. At present, forty-four such clinics are operating. Ultimately, this program calls for the establishment of sixty-eight treatment clinics.

The over-all purpose of this program includes more than dental care for school children. Interesting and significant data expected to accrue from this program will directly benefit both the profession and the science of dentistry.

To the profession, the benefits will be twofold. First, it will definitely increase

the volume of private practice as a result of the teaching and examination procedures, and will imbue the growing child with the necessity for proper care of the oral cavity. Secondly, the child patient of today will be the forerunner of the cooperative and well-informed patient of the future.

To dentistry, the purpose of this program is to investigate in detail the existing dental conditions on a massive scale and to evaluate carefully all possible corollaries and variables. The findings are expected to throw light on the following facts:

1. Incidence of caries in a group comprising 750,000 children.
2. Incidence of caries in specific teeth and specific tooth surfaces and possibly the etiology of dental caries.
3. Incidence of malocclusion and its relationship to caries incidence.
4. Relation of caries distribution in the schools to the total population of the city and the indication this figure may give of the decrease or increase in the number of dentists.
5. Distribution of failing restorations and their significance in terms of poor dental work or rampant destruction beyond the control of the dentist.
6. Significance of the extreme as compared to the mean values, with regard to age range and sex.
7. Distribution and incidence of enamel hypoplasia, gingivitis, poor oral hygiene, etc., and their interrelationship.

These are but a few of the facts that will be forthcoming from the examinations. The treatment program will present other material that should prove to be of direct importance to dentistry.

It is hardly necessary to emphasize the urgent need for such a comprehensive program for Chicago's school children. More than 90 per cent of children in all grades are in immediate need of dental care, and, of this large group, many are without the funds to obtain such care. As an immediate result of this program, it will be possible for these underprivileged children to have prompt and capable treatment. Those children whose parents are financially able, but are unaware of their children's dental defects, will be examined and directed to their family dentist.

This program will benefit the children and their teachers. It will increase public interest in dental health and make Chicago a civic pioneer in this important phase of public health service.

From the long range viewpoint, our dental health program should be a facet of a general health program for young people. We must build for tomorrow. Healthy children are more than a physical asset to our nation. These citizens of tomorrow will grow to adulthood with an appreciation of the benefits of democracy, with a zest for life which will give them health and security. This spritual aspect of a national health program cannot be ignored.

Today, national interest is focused on the large percentage of our young men who suffer from poor health resulting from neglected teeth. In fact, a shockingly high percentage of rejections under the Selective Service Act are due to infection and loss of teeth. We cannot hope to build a strong national defense program while the dental health of the young people is neglected. This fact is only now being recognized by government and army officials, and strong remedial measures are being planned.

Those of us who have been working for the same ends in the field of public dental health take heart from this revitalized interest in our work.

EFFECTIVE LIVING

A Modern School Health Text Book

Effective Living. By C. E. Turner, A.M., Sc.D., P.H., and Elizabeth McHose, B.S., M.A. 432 pages. 164 illustrations. Cloth binding. St. Louis: C. V. Mosby Co., 1941. Price, $1.90.

IT is a privilege to review and recommend "Effective Living" because this is one health textbook in which the authors have endeavored to authenticate every statement before presenting it as a health fact to the pupil.

The purpose of the book, as explained by the authors, is "to help youth discover ways of effective living." In this scientific age, youth demands facts. Health facts are fascinating when interestingly presented. The authors have successfully striven to present their authenticated facts in an interesting manner.

The book is divided into three parts. Part One deals with effective living for the individual; Part Two, with effective living in the family, and Part Three with effective living in the community.

Its 164 illustrations are as modern and attractive as the text itself.

The reviewer's judgment of the book is necessarily influenced by the contents of chapter, or unit, 4, "Good Teeth." In it, the authors sanely and interestingly discuss the nature, development and structure of the teeth; caries; root abscesses; diseases of the gums; mouth hygiene, dentifrices, and dental care. A self-checking list at the end of the chapter offers the reader an opportunity to appraise his dental knowledge. Adequate pupil references are indicated for those who wish to pursue the subject further.

Every dentist might well add "Effective Living" to his library or reception room table. Furthermore because it is one of the few health textbooks that deal adequately and sanely with the subject of dental health, we recommend that you recommend it to your school and health authorities.

L. W. M.

DENTAL PROGRAM, SHOREWOOD, WIS.

THE annual health report for Shorewood, Wis., 1940-1941, contains a comprehensive summary of its well-known dental health activities.

Shorewood's dental health educational program is developed for three specific groups: infant and preschool, school and adult. The infant and preschool program stresses the importance of attention of the parent to such subjects as nutrition, tooth eruption, mouth hygiene and finger habits. Education is carried on through the medium of infant centers, summer round-ups, individual conferences and individual and group conferences.

The educational program for elementary schools has two phases: health office practices and field practices. The health office practices consist of graded dental health education conducted in the dental office and given both to groups and to individuals, instruction in toothbrushing, semi-annual mouth surveys, referal to family dentists for opinion and correction, follow-up of all cases and individual conferences with the child, parent and teacher. Field practices consist of lectures to adult groups, home conferences and public meetings.

The educational program for adults consists of distribution of literature, lectures for parent-teacher groups, partici-

pation in health programs, reading references, child participation and exhibits.

All operative work is referred to the family dentist. The success of this program is demonstrated in Table 1.

TABLE 1.—SCHOOL SERVICE

	High School	Atwater	Lake Bluff	St. Roberts	Total
Total enrollment	1,196	557	534	726	3,013*
Number of students participating in dental program	1,195	557	534	726	3,012
Total number of visits to dental health offices	2,550	1,322	1,252	1,903	7,036
Total number of referals to family dentist for his opinion	635	335	309	540	1,819†
Percentage of students who had completed their treatment during the year	86	87	88	87	87

*Includes kindergarten.
†Some students being referred more than once.

TABLE 2.—PRESCHOOL SERVICE

			Summer Round-Up	
	Infant	Preschool	1940	1941
Number of children examined	36	545	93	108
Total number of visits to dental health office	102	878	111*	
Number referred for opinion of the family dentist	1	145	18	17
Percentage who had completed their treatment during the year		91	100*	

*The follow-up of the spring examination will be completed in the fall of 1941.

TABLE 3.—MOUTH SURVEY

Year	Good Teeth Per Cent
1928-1929*	22
1929-1930†	47
1930-1931	74
1931-1932	82
1932-1933	87
1933-1934	84
1934-1935	85
1935-1936	86
1936-1937	85
1937-1938	84
1938-1939	86
1939-1940	86
1940-1941	87

*Before program was introduced.
†Program introduced.

TABLE 4.—SUMMER ROUND-UP

Year	In Good Condition at Spring Examination Per Cent	In Good Condition at Fall Examination Per Cent
1932	72	92
1933	67	88
1934	65	100
1935	78	97
1936	75	97
1937	76	100
1938	60	100
1939	79	100
1940	83	100
1941	84	Not complete

The school service program consists of annual inspection of the child's teeth. No operative work is performed by the board of health or board of education.

The preschool service program consists of examination of the child's teeth in the summer round-ups and kindergarten. All children who are examined in the spring round-up are re-examined the following fall, when they enter

school for the first time. The success of Shorewood's preschool program is indicated in Table 2.

The Shorewood dental educational program has been in operation since the school year of 1929-1930. Prior to its inception, only 22 per cent of the children had teeth in good condition. Last year, this figure increased to 87 per cent, as indicated in Table 3.

The improvement in the dental condition of the preschool child as a result of this summer round-up program is shown in Table 4.

NEW IOWA HANDBOOK ON DENTAL HEALTH EDUCATION FOR THE ELEMENTARY TEACHER

THE Bureau of Dental Hygiene, State University of Iowa, cooperating with the Iowa State Department of Health, has recently issued an excellent new handbook on dental health education, compiled by John C. Brauer, D.D.S., M.Sc.; Myrtle B. Argo, R.N., M.N., and Dorothy B. Carney, A.B.

The handbook contains helpful information to teachers regarding the Iowa plan for dental health, with instructions to the teachers regarding new dental health materials which can be obtained from the Bureau of Dental Hygiene at the university. Using this plan, the teacher can introduce dental health in the classroom as a separate subject or as a part of general health education. Indeed, she may integrate it with other subjects if she so chooses. Besides containing specific information for the teaching of dental health graded according to the age level of the child, this book contains a list of supplementary materials and the source from which it can be obtained.

This new handbook on dental health education is recommended to all health workers interested in this important phase of health work.

A DENTAL HEALTH GUIDE

IN response to many requests for an inexpensive piece of educational material, the Committee on Public Health and Education has approved the leaflet illustrated here. It is an eight page folder, six by three inches in size, and contains concise information on the following subjects: The Baby Teeth; The Permanent Teeth; Dental Care; Decay; Brushing; and Nutrition.

Because it is so very inexpensive, yet attractive and informative, it is a practical piece of literature for distribution in schools and at health meetings. Dentists, too, may wish to distribute them to patients.

Prices: 5c per single copy; 100 copies 75c; 1,000 copies $6.00; 5,000 copies $25.00; 10,000 copies $40.00.

Order them in quantity for the members of your dental society or for your schools. Bureau of Public Relations, American Dental Association, 212 E. Superior St., Chicago, Illinois.

COMMITTEE ON DENTAL PREPAREDNESS

PREPAREDNESS LUNCHEON

MANY problems perplexing the dental profession have arisen out of the operation of the greatly expanded defense program. This is more notably true since the assignment of dental examiners to the 6,400 local selective service boards in the United States.

To attempt to furnish a solution to some of these problems, the Committee on Dental Preparedness has arranged a luncheon meeting for October 29, 1941, at the time of the Annual Meeting of the American Dental Association in Houston, Texas.

Because of the importance of the subjects to be discussed, this luncheon meeting will be open to the members of the American Dental Association.

The meeting will be addressed by men well qualified to speak on dentistry's part in the defense program: Lieut. Col. Carlton S. Dargusch, deputy director of the national Selective Service System, who will speak on the "Administration of the Selective Service Law"; Capt. Albert Knox (DC) USN, chief of the Dental Division, Bureau of Medicine and Surgery, who will discuss the dental program of the United States Navy; Brig. Gen. Leigh C. Fairbank, commanding officer of the Dental Corps of the United States Army, who will discuss the plans for that branch of the service, and Lieut. Com. C. Raymond Wells (DC) USNR, the chief dental officer of the Selective Service System, who will speak on dental phases of the selective service law.

The meeting will begin promptly at 12 o'clock noon in the South American Room of the Rice Hotel. Tickets to the luncheon will be available at the meeting.

DEFERMENT OF PREDENTAL STUDENTS

During the past month, the question of the deferment of predental students has had the serious attention of several dental schools and of the Committee on Dental Preparedness, because of the reluctance and failure of some selective service boards to give deferment to these students. However, principally through the efforts of C. Raymond Wells, chief dental officer of the Selective Service System, collaborating with the Committee on Dental Preparedness, the situation has been satisfactorily adjusted in these instances. In this connection, the following official correspondence was forwarded to the deans of the dental schools for their information and use.

August 16, 1941

Dr. C. Raymond Wells,
Chief Dental Officer,
Selective Service,
Washington, D. C.

Dear Dr. Wells:

It has been brought to this Committee's attention from several sources that some difficulty has been experienced by a few of our dental schools in the matter of the deferment of bona fide predental students.

May I ask you to kindly furnish the Committee with a statement of the present policy of Selective Service in this matter so important to our schools and the future stability of the dental profession.

Very sincerely yours,
C. WILLARD CAMALIER, *Chairman*,
Dental Preparedness Committee.

August 21, 1941

Dr. C. Willard Camalier,
1726 Eye Street, N. W.,
Washington, D. C.

Dear Dr. Camalier:

This is in response to your letter of Au-

gust 16, requesting the policy of National Headquarters in respect to students about to commence the study of dentistry.

This Headquarters holds that a student enrolled in a dental college may be considered as a dental student even though classroom work does not commence for several months following enrollment provided early enrollment is established as a matter of custom.

For the Director,
CARLTON S. DARGUSCH, Lt. Col. JAGD,
Deputy Director.

The Committee on Dental Preparedness requested that this statement of policy be also forwarded by the Selective Service System to the local boards.

AMERICAN DENTAL ASSOCIATION SCIENTIFIC AND HEALTH EXHIBITS

THE Scientific and Health Exhibits in the new Sam Houston Coliseum promise to present a tabloid of "dentistry in progress." In the spacious, well-lighted and adequately ventilated 71,000 square feet, an unusually large number of new exhibits will be shown. Among the timely and authoritative exhibits are the Army Medical Museum's "Activities of the Army Dental Corps"; the U. S. Public Health Service's "Dental Activities of the U. S. Public Health Service"; V. H. Kazanjian's "Surgical and Prosthetic Restorations of the Face and Jaws," and George M. Hollenback's "Instruments and Methods Used in Testing Filling Materials." Exhibits from our neighbors in Chile and Argentina will be displayed.

Make your appointments for meeting your friends in the exhibit hall so that those extra minutes can be used to your advantage in observing and learning.

The event: Scientific and Health Exhibits.

The place: Sam Houston Coliseum, Houston, Texas.

The date: October 27-31, 1941.

LEO F. MARRÉ, *Chairman,*
Scientific and Health Exhibit Committee.

COMMITTEE ON LEGISLATION

RECENT DECISIONS

DENTAL PRACTICE ACT—REVOCATION OF LICENSE WITHOUT NOTICE AND HEARING DECLARED UNCONSTITUTIONAL

THE Texas dental practice act authorizes the board of dental examiners to suspend or revoke a license to practice upon proof that the licentiate has been convicted of a felony involving moral turpitude. The statute also provides that the receipt by the board of a certified copy of the records of the court of conviction showing a final conviction shall be sufficient evidence to justify and require such revocation by the state board of dental examiners.

On the basis of these provisions, the board of examiners, without notice and

hearing, revoked the license of the plaintiff "on the ground that he had been convicted of forgery in the State of Oklahoma." The plaintiff then brought suit to cancel the board's revocation order and to require reinstatement of his license. The trial court refused to reinstate his license as requested and he appealed to the court of civil appeals of Texas.

The court first decided that the dental practice act in stating that "the receipt by the board of a certified copy of the records of the Court of Conviction showing a final conviction shall be sufficient evidence to justify and require such revocation by the state board" made it mandatory for the board to revoke the license of any one convicted of a felony involving moral turpitude.

The court then determined that such a provision does violence to the constitutional guarantee of due process. Until an order of revocation is made by the board, the license remains in effect. Before the board can act intelligently or properly, it should verify a number of matters. It should determine whether the licentiate and the defendant in the judgment of conviction are the same person. If the conviction was in another jurisdiction, it should determine (1) the jurisdiction of the convicting court, (2) the sufficiency of the record to show a final conviction and (3) whether the crime was in fact a felony and involved moral turpitude. The court was of the opinion that the licentiate is entitled to a hearing on these matters before he has his license revoked, and a statutory provision requiring a revocation without notice and hearing constitutes a denial of due process under both state and federal constitutions.

For these reasons, the court, in effect, remanded the case to the trial court, instructing it to grant an injunction temporarily reinstating the license pending a trial on the merits of the case.—Francisco *v.* Board of Dental Examiners, 149 S.W. 619 (Texas, 1941).

Note: The foregoing decision, declaring Section 4549 of the Texas Dental Law unconstitutional because it does not provide for notice and hearing seriously crippled the effectiveness of the act. To remedy this, a bill was introduced in the 1941 session of the state legislature which amended Section 4549 by making provision for notice and hearing prior to any revocation action by the board, as well as the right to appeal to the court for a review of the board's action. This bill was made a law July 9, 1941. Since it was specifically drafted to plug the gap caused by the decision in the Francisco case, it should be free of the constitutional difficulties encountered by the previous section.

DENTAL PRACTICE ACT—INTERPRETATION OF PHRASE GRANTING RIGHT TO APPEAL TO COURTS

WITHERS and others had been charged with unprofessional conduct and, after a hearing by the State Department of Registration of Utah, had had their licenses revoked. They appealed to the district court, which, reviewing the record of the hearing before the department, sustained its action. From this decision of the district court, Withers appealed to the Supreme Court.

Withers maintained that the district court had erred in failing to grant him a jury trial, basing his contention upon the fact that the state dental law granted him the right to "institute an action" in the district court if he considered himself

directly affected and aggrieved by any ruling of the department of registration. Withers alleged that the words "institute an action" implied that the matter was to be treated as an original action and the evidence introduced at the hearing before the board would have to be discarded and the whole case presented to the jury as an entirely new matter. The Supreme Court denied the validity of this contention, stating that it appears that the intention of the legislature was to confer upon the district court the power to inquire into those grievances set out in the plaintiff's complaint touching the entire proceeding before the department, including, if made a basis of complaint, the power to decide that the findings of the dental committee were contrary to the weight of the evidence.

The court believed that, in this case, the introduction in evidence of the entire record of the proceedings before the department was sufficient to conform to the statute. The court stated that where a full record has been made of the proceedings before the department, and no question is raised concerning its validity, it is evidence (1) of what the actual proceedings were and (2) whether the evidence of unprofessional conduct, and the findings thereof, are in accord with the weight of the evidence before the department. The Supreme Court held that the plaintiff was not entitled to a jury trial and the lower court had not erred in refusing to grant it.

The Supreme Court also determined that the evidence of the plaintiff's unprofessional conduct was sufficient to justify the action of the lower court. Therefore, it affirmed the decision of the lower court.—Withers *et al. v.* Golding, Director, Department of Registration of the State of Utah (Utah, 1941).

STATE DENTAL LEGISLATION, 1941

ALABAMA

Not in session

ARIZONA

Adjourned March 17, 1941

Laws enacted: House 1, which provides for the creation of a state department of health, state board of health and a state laboratory. The state board of health is to be composed of two physicians and three other persons selected for their interest in public health. Theoretically, a dentist could be chosen as one of these members, but there is no requirement that a dentist be a member of the board.

ARKANSAS

Adjourned March 13, 1941

Laws enacted: Senate 291 provides that veterans of the army, navy, marines or nurses shall be given a 10 per cent credit on any licensing examination they may take for a profession, trade or employment.

H. 587 amends the medical practice act to require annual registration for physicians and also makes changes in the requirements for licensure.

CALIFORNIA

Adjourned June 14, 1941

Laws enacted: A. 563 provides that any nonprofit corporation formed for defraying the cost of professional services must include at least one-fourth of all licentiates of the particular profession becoming members and provide all members of the profession a uniform opportunity to render service. Such nonprofit corporations shall be subject to provision by the particular profes-

sional board under which its members are licensed. This law would appear to permit the formation of nonprofit dental service corporations, under the above restrictions.

A. 811 permits any professional board in the state to renew the license of any person who has served in the armed forces of the United States without the payment of fees for delinquency.

A. 1148 permits pupils to visit the dentist without being counted as absent from secondary schools. (This bill supplements a law passed in 1939 which permits primary school children to visit dental offices without being counted absent.

A. 1450 provides that applicants who have failed licensing examinations three times shall not be permitted to take further examinations unless they complete an additional year of graduate work in a reputable dental college approved by the board.

A. 1451 amends the law relating to dentistry in relation to the procedure to be followed in making an accusation and notifying the accused party preparatory to holding a hearing to determine the merits of the accusation.

A. 2576 authorizes county school superintendents to employ dental hygienists as well as nurses to supervise the health of pupils enrolled in elementary schools.

S. 1124 defines the meaning of the term "teaching and research clinic" and prohibits the operation of a private pay clinic by a corporation or by any person not licensed to practice the healing arts.

COLORADO
Adjourned April 7, 1941

No legislation of particular interest to the dental profession was enacted.

CONNECTICUT
Adjourned June 4, 1941

H. 2683 amends the dental practice act to permit a dentist who is physically or mentally unfit to conduct his business in his dental office to employ a duly licensed dentist to continue his practice during such incapacity.

H. 2686 establishes a bureau of industrial hygiene in the state health department.

H. 2762 exempts the Hartford Dispensary from the provisions of the dental practice act provided permission to practice dentistry shall be granted by the state dental commission.

DELAWARE
Adjourned May 12, 1941

No legislation of particular interest to the dental profession was enacted.

FLORIDA
Adjourned June 6, 1941

S. 92, H. 202. This measure completely revised the dental practice act. Changes were made in the definition of practice, requirements for licensure and regulation of advertising, and in many other parts. Under the new law, advertising to the public by laboratories is prohibited, the American Dental Association Council on Dental Education classification of dental schools is adopted and practice is restricted to citizens.

S. 846 provides that any one who practiced dentistry in Calhoun and Gulf counties for twelve years and in the state of Florida for twelve years, should not be required to have passed the state dental examination, but shall have to comply with the law in all other respects. This is evidently a bill to provide privileges for one or more men who cannot comply with the requirements of the law.

H. 1230, S. 634 amends the law relating to the appointment of medical examiners and provides that the board shall consist of ten members appointed by the governor. The medical society does not recommend appointees, but the law

establishes rather high qualifications for them.

GEORGIA
Adjourned March 22, 1941

Laws enacted: S. 55 amends the act authorizing the operation of group hospital service plans by extending its scope to cover any approved hospital in the state. The amendment also provides that contracts cannot be issued in any county where the county medical society has not approved the plan.

IDAHO
Adjourned March 8, 1941

No legislation of particular interest to the dental profession was enacted.

ILLINOIS
Adjourned June 30, 1941

No legislation of particular interest to the dental profession was enacted.

INDIANA
Adjourned March 10, 1941

Laws enacted: H. 349 provides that actions for damages against physicians, surgeons, dentists, hospitals and sanitariums be filed within two years of the date of occurrence of the alleged injury.

IOWA
Adjourned April 10, 1941

No legislation of particular interest to the dental profession was enacted.

KANSAS
Adjourned April 9, 1941

Laws enacted: S. 246 provides that in every city in the state with a population of more than 115,000 and a county valuation of less than 150 million dollars, every practicing dentist must register annually with the city clerk and pay a fee of $10 for a license. The fees are to be kept by the city and used to develop and maintáin a dental library. No dentist in such cities shall be required to pay a license or occupation tax.

KENTUCKY
Not in session

LOUISIANA
Not in session

MAINE
Adjourned April 26, 1941

Laws enacted: S. 344 provides a uniform narcotic law regulating the sale and prescription of narcotics. Physicians and dentists in good faith and in the course of professional practice may prescribe, administer and dispense narcotic drugs or supervise dispensation. They must, however, keep a record of all sales and dispensation.

H. 676 amends three sections of the dental practice act. The first amendment revises the section prohibiting advertising by dentists to prohibit advertising by dental laboratories or technicians as well. The second amendment deals with the definition of a "practicing dentist" and provides that any one who furnishes, constructs, reproduces or supplies artificial substitutes for natural teeth except upon the prescription of a licensed dentist shall be deemed to be practicing dentistry. The third amendment provides that members of the dental board shall be entitled to compensation of $10 a day rather than $5 as previously provided.

MARYLAND
Adjourned March 31, 1941

Laws enacted: S. 386 provides that physicians, hospitals and dentists must report injuries arising from automobile accidents or deadly weapons.

MASSACHUSETTS
Recessed

Laws enacted: H. 2301 permits the formation of medical service corporations to provide medical care upon a voluntary insurance basis. A majority of

the directors in each corporation must be approved in writing by a medical society with at least 2,000 members. Every registered physician shall have a right to enter into a written agreement with the corporation, but the normal physician-patient relationship must be preserved.

MICHIGAN

Recessed to October 9, 1941

No legislation of particular interest to the dental profession has been enacted.

MINNESOTA

Adjourned April 23, 1941

Laws enacted: H. 83 authorized the formation of nonprofit hospital insurance corporations. It provides that they shall not be subject to the laws governing insurance, but that they shall be under the control of the insurance commissioner and must file annual reports to him.

MISSISSIPPI

Not in session

MISSOURI

Adjourned July 12, 1941

Laws enacted: H. 166 adds several subsections to the dental law for the purpose of permitting a prosecuting attorney or the state dental board to ask the circuit court to enjoin from the unauthorized practice of dentistry any person who shall practice dentistry without a license or in violation of the dental law.

MONTANA

Adjourned March 6, 1941

Laws enacted: H. 47 requires that no person shall be qualified to receive a license to practice dentistry who is not a United States citizen. The amendment also completely revises the section which defines the acts which constitute the practice of dentistry. This amendment permits laboratories and technicians to construct dental appliances only on order or prescription of a licensed dentist.

S. 67 amended the narcotic law to require dentists, physicians, etc., to keep records of the purchase and dispensation of narcotics.

NEBRASKA

Adjourned May 23, 1941

Laws enacted: Bill 252 provides that 10 per cent of all of the fees held in the state treasury for the credit of various examining boards shall be placed in the general fund for use as decided by the legislature. This would include 10 per cent of the funds held by the board of dental examiners. Bill 430 permits the formation of nonprofit hospital service corporations.

NEVADA

Adjourned March 20, 1941

Laws enacted: S. 6 revises that section of the law which defines the acts which shall constitute unprofessional conduct. The amendment prohibits advertising of prices, professional superiority, terms of credit, guaranteed work or free service. It also declares that the circulation of false or misleading statements, fraud in securing of license, division of fees, aiding an unlicensed person to practice and other acts all constitute unprofessional conduct and are grounds for the revocation of licenses.

NEW HAMPSHIRE

Adjourned June 13, 1941

Laws enacted: S. 262 amends the dental practice act to provide that dental students may perform dental operations in a general hospital under the supervision of a registered dentist without being guilty of practicing dentistry without a license.

NEW JERSEY

Recessed to November 13, 1941

Laws enacted: A. 38 revises the sec-

tion of the dental law dealing with the grounds for the revocation of licenses. The amendments provide that advertising of any manner shall constitute grounds for revocation of licenses. The bill also adds a complete new section to the law which defines the acts which are declared to constitute the practice of dentistry. The section is similar to that now enacted in most of the other states. Among the provisions is one which prohibits the making of artificial dental restorations except upon the prescription of a dentist and without offering them for sale directly to the public.

A. 493 appropriates the sum of $12,000 to the state department of health to organize a rural mobile clinic.

NEW MEXICO

Adjourned April 12, 1941

Laws enacted: H. 123 establishes a state basic science board to examine all candidates for license to practice the healing arts in the basic sciences underlying the practice of these professions.

NEW YORK

Adjourned April 3, 1941

Laws enacted: S. 1010 provides that nonprofit medical and hospital service corporations must set aside certain reserves for the protection of their subscribers. S. 1913 provides that medical and hospital service corporations may invest in real estate to an amount equal to 3.5 per cent of their net premium income.

NORTH CAROLINA

Adjourned March 15, 1941

Laws enacted: S. 128 permits the incorporation of nonprofit hospital service corporations and regulation of their activities by the state commissioner of insurance. H. 549 provides that a definition of the practice of radiology shall be included in the definition of the "practice of medicine," but it does not prevent the practice of radiology by dentists, osteopaths, chiropractors and chiropodists.

NORTH DAKOTA

No legislation of particular interest to the dental profession was introduced.

OHIO

Adjourned May 27, 1941

Laws enacted: H. 45 provides that two or more local boards of education may combine resources for the purpose of hiring doctors or dentists to care for school children. H. 51 permits the formation of medical service corporations. Each company shall have fifteen members of its board of directors, six of whom are not physicians. At least 51 per cent of the physicians in a county must agree to render service before the corporation can begin to provide service. Subscribers' incomes shall not exceed $150 a month for individuals or $200 for married persons. H. 97, S. 307 amends the dental practice act to prohibit the sale, construction or repair of dentures, bridges or appliances by any one who does not sell, construct or repair them on the prescription of a licensed dentist.

OKLAHOMA

Adjourned May 23, 1941

Laws enacted: S. 13 provides that the membership of the committee on standardization of hospitals shall include a dentist.

OREGON

Adjourned March 15, 1941

Laws enacted: S. 243 amends the narcotic act to permit codeine to be sold in limited quantities in accord with the provisions of the act.

PENNSYLVANIA

Adjourned July 15, 1941

No legislation of particular interest to the dental profession was enacted.

RHODE ISLAND
Adjourned April 30, 1941

Laws enacted: S. 51 increases the sums available for medical, dental and hospital benefits under the workmen's compensation act by 33⅓ to 50 per cent. Dental service is defined as "services rendered in making, repairing and replacing artificial teeth and dentures."

SOUTH CAROLINA
Adjourned May 24, 1941

No legislation of particular interest to the dental profession was enacted or introduced.

SOUTH DAKOTA
Adjourned March 7, 1941

Laws enacted: S. 199 amends the narcotic law to require physicians, dentists, etc., to keep records of all habit-forming drugs purchased and dispensed, whenever it exceeds certain minimum amounts. S. 200 amends the narcotic law to provide that dentists must keep records of all narcotic orders for at least two years after use.

TENNESSEE
Adjourned February 5, 1941

No legislation of particular interest to the dental profession was enacted.

TEXAS
Adjourned July 3, 1941

Laws enacted: S. 464 amends the dental practice act with respect to the procedure to be followed in giving notice to the accused of hearings to be held by the state board on whether the accused's license should be revoked. This amendment was made necessary by a court ruling holding that the dental law was unconstitutional because it did not make provision for adequate notice to accused persons.

UTAH
Adjourned June 12, 1941

No legislation of particular interest to the dental profession was enacted.

VERMONT
Adjourned April 10, 1941

Laws enacted: H. 52 permits any three dentists, chiropractors, chiropodists or optometrists to form a corporation to provide their type of service under the same privileges and restrictions now governing medical service corporations.

VIRGINIA
Not in session

WASHINGTON
Adjourned March 13, 1941

Laws enacted: H. 368 amends the dental practice act to require that members of the dental board be chosen by the governor from a list of five or more names submitted by the state dental society. The amendment also gives the board power to adopt such rules as it deems necessary for the enforcement of the act.

WEST VIRGINIA
Adjourned March 8, 1941

No legislation of particular interest to the dental profession was proposed or enacted.

WISCONSIN
Adjourned June 6, 1941

Laws enacted: S. 437 revised certain sections of the narcotic drug act. A. 703 revises and amends the law relating to the practice of dental hygiene. The most noteworthy change is the creation of a special class of hygienists called "public health dental hygienists." Hygienists who desire to work in schools or for health boards will be examined by a special committee and will be expected to have special qualifications.

WYOMING
Adjourned February 22, 1941

No legislation of particular interest to the dental profession was enacted.

RESEARCH COMMISSION

LIST OF CERTIFIED GOLD WIRE ALLOYS
(A.D.A. Specification No. 7)

ALL of the wires on the list of certified products have been retested at the National Bureau of Standards to determine whether they still comply with the requirements of A. D. A. Specification No. 7. The following list is composed of the wires that have been certified by their respective manufacturers and which were found to comply according to tests made since the last printing of the list (THE JOURNAL, March 1941, p. 481).

Wires which failed to comply were removed from the list and newly certified wires that passed the tests have been added.

CERTIFIED WROUGHT GOLD WIRE ALLOYS (A.D.A. SPECIFICATION NO. 7)

Alloy	Manufacturer or Distributor
Aderer No. 1	Julius Aderer, Inc.
Aderer No. 3	Julius Aderer, Inc.
Aderer No. 4	Julius Aderer, Inc.
Aderer No. 20 Clasp	Julius Aderer, Inc.
Baker Q. A.	Baker and Company, Inc.
Crown Hylastic	General Refineries, Inc.
Deepep—Hard	Thomas J. Dee and Company
Goldsmith Extra High Fusing	Goldsmith Bros. S. and R. Co.
Goldsmith Medium Fusing	Goldsmith Bros. S. and R. Co.
Goldsmith Regular High Fusing	Goldsmith Bros. S. and R. Co.
Jelenko No. 3	J. F. Jelenko Co., Inc.
Jelenko Super	J. F. Jelenko Co., Inc.
Neydium 9	The J. M. Ney Company
Ney-Oro Elastic No. 4	The J. M. Ney Company
Spyco No. 4	Spyco Smelting and Refining Co.
Stern No. 2657	I. Stern and Co. Inc.
S. S. White No. 61 Metalba	The S. S. White Dental Mfg. Co.
Williams No. 1 Super	The Williams Gold Refining Co.
Williams No. 2 High Fusing	The Williams Gold Refining Co.
Williams No. 3 High Tensile	The Williams Gold Refining Co.

LIST OF CERTIFIED DENTURE RESINS
(A.D.A. Specification No. 12)

ON page 325 of the February 1941 issue of THE JOURNAL, the Research Commission published a specification for Acrylic resin. In the foreword to this specification, it was stated that the Commission would consider certifications of manufacturers immediately so that a list of resins which comply with the specification could be published without delay. The first list was published on page 1166 of the July 1941 issue of THE JOURNAL. So far, only the materials listed below have been certified by the manufacturer or distributor, tested at the National Bureau of Standards and found to comply with the specification requirements.

Several other materials are in the process of certification, and additions will probably be made to the list at an early date.

Material	Form	Certified by
Densene	Powder/liquid (clear)	Cosmos Dental Products, Inc.
Densene	Powder/liquid (pink)	Cosmos Dental Products, Inc.
Lucitone	Powder/liquid (pink)	The L. D. Caulk Co.
Lucitone	Powder/liquid (clear)	The L. D. Caulk Co.
Lucitone	Plastic cake (pink)	The L. D. Caulk Co.
Lucitone	Plastic cake (clear)	The L. D. Caulk Co.

COUNCIL ON DENTAL EDUCATION

SECOND CONGRESS ON DENTAL EDUCATION AND LICENSURE

THE Second Congress on Dental Education and Licensure of the Council on Dental Education will be held at the Palmer House in Chicago, February 21, 1942. The date of the congress, which was originally scheduled for February 14, has been changed in conformance with the plans for the Midwinter Meeting of the Chicago Dental Society, which will be held at the Palmer House, February 23-26, 1942. The following committee has been designated by the Council to work out the program and make all arrangements for the congress: William N. Hodgkin, chairman, Warrenton, Va.; J. Ben Robinson, dean of the Baltimore College of Dental Surgery; Walter A. Wilson, secretary of the New Jersey State Board of Dental Examiners; Willard C. Fleming, dean of the College of Dentistry of the University of California, and Harlan H. Horner, secretary of the Council on Dental Education.

KANSAS CITY-WESTERN DENTAL COLLEGE MERGES WITH THE UNIVERSITY OF KANSAS CITY

A PROGRESSIVE step for dental education in the Southwest was taken during the summer when the Kansas City-Western Dental College merged with the University of Kansas City. The dental college retains its name, but becomes in fact the dental school of the university. R. J. Rinehart will continue to serve as dean. The college draws students from a wide area in the Southwest. The enrollment in 1940-1941 was 240.

The University of Kansas City was organized and formally incorporated in 1929 as a privately supported, nondenominational institution.

PROGRESS REPORT OF COMMITTEE ON SPECIALTIES IN DENTISTRY*

THE Committee on Specialties in Dentistry was instructed by the Council on Dental Education at the time of its appointment December 1, 1940 "to inquire into the existing situation touching upon the development of the specialties in dentistry and to report upon what obligations the Council should assume with reference thereto." This preliminary or progress report deals only with the problems confronting the committee and the means to be employed to bring about their possible solution.

As a preface to its own undertaking, the committee takes the liberty of quoting from a report of a similar committee presented to the National Association of Dental Examiners at its annual meeting in Atlantic City, N. J., in 1937. This report read in part as follows†:

After the study of the various systems of these specializing groups, it was concluded that the subject was too complex to apply intelligently any general system of arrangement covering all groups, but that the set-up of each individual group must be specifically constituted for that specialty; also that each specialty must to some extent assume the responsibility of developing the most constructive means for its individual fundamental and clinical training, together with means for the application of that training....

Very little opportunity has been afforded for mature specialization in oral surgery, orthodontia, periodontia, pedodontia or prosthodontia, as preparation has been attained chiefly by self-training and private instruction, or both. Such instruction is superficial and inadequate and may jeopardize the intimate understanding of the fundamentals of a specialty such as oral surgery, where surgical procedure and pathological involvement necessitate knowledge of these relationships necessary for the preservation of human life. The various extension, advanced and "post-graduate" courses now being offered are unquestionably very desirable for the general practictioner, but cannot, because of their unavoidable brevity, provide intensive or thorough training for the most effective practice of such specialties as oral surgery, or orthodontia, which can be attained only through a combined clinical and biological training in the medicodental aspects of these two branches of dentistry. It is in these two branches of specialization that the general practictioner becomes most intimately associated, and there is a growing feeling that these departments are most deserving of more adequate preparation, on account of their relationship to public health....

The consensus of opinion among educators, specialists and general practitioners of dentistry expressed the feeling that there was a lack of educational facilities for the basic training in postgraduate work leading to specializing. If specific subdivisions of specialistic training in dentistry are necessary, and for such there appears a definite place in our profession, it would seem imperative that those wishing to specialize must first qualify in the general broad field of that specialty with a thorough biological and clinical concept of that branch of dentistry in which they wish to possess superior knowledge. It is the belief of this committee that the most applicable solution for the improvement of the status of dental specialization at this time lies in the creation of graduate educational facilities whereby those seeking to specialize may engage in a course of instruction sufficient in duration, broadness of scope and intensity of training. Such a course should terminate in an examination for proficiency in both technical and biological knowledge of the selected branch of study. Important improvements

*At a meeting of the Council on Dental Education held on December 1, 1940, a Committee on Specialties in Dentistry was appointed consisting of Robert P. Thomas, chairman, M. Webster Prince and Leroy M. S. Miner. This progress report of the committee was presented to the Council June 28, 1941.

†Proc. 55th Ann. Meet. Nat. Ass'n D. Examiners, 1937, pp. 27-30.

in dental education are required for the attainment of this objective. . . .

It is the sense of this committee, after thoroughly considering all forms of voluntary and compulsory certification, special license and regulatory legislation, that a solution cannot be offered until there is a readjustment of dental specialization by the reorganization of graduate educational facilities for specialization; so that the general practitioner and the public may base their selection of the specialist on such qualifications. With the establishment of these provisions, there will develop a demand that the specialist avail himself of this training in his preparation for specialization, and with such facilities for training, a system of certification of proficiency could subsequently more reasonably and justly be demanded by legislative groups. It would therefore seem more logical to create an adequate comprehensive system of preparation in the various specialties before attempting any form of certification, voluntary, compulsory or legislative. . . .

In analyzing this survey of the present status of dental specialization, your committee recommends that the National Association of Dental Examiners lend its support and encouragement in the establishment of more adequate graduate facilities in the dental colleges, for the training of specialists in both the biologic and the clinical aspects of these specialties, and that a copy of these findings be sent to the Secretary of the American Dental Association and the Secretary of the American Association of Dental Schools.

The situation has not greatly changed since the above-quoted report was presented to the National Association of Dental Examiners in 1937. Your committee is confronted with three basic questions to which it believes acceptable answers must be secured before specialization in dentistry can be headed in a wholly satisfactory direction. These three questions are:

1. Who is a specialist in dentistry?

2. What are the specialties in dentistry?

3. How shall the specialist be recognized by the public? Shall he be certified by his fellows, shall he be licensed by state authority or shall he be recognized in some other manner not yet proposed?

In casting about for a basically dependable answer to the first question "Who is a specialist in dentistry?" the committee has thus far been baffled. It may seem at first thought a simple question to answer. The American Dental Association seems not to have answered it in any specific way. Neither has the American Medical Association anwered the basic question despite its elaborate system of certification of specialists in medicine in many fields.

Not finding a workable, satisfactory definition of a specialist in dentistry in professional circles, the committee diligently searched court decisions, but with little success. In 58 Corpus Juris, page 822 (Indiana), a fragmentary definition relating to a specialist in medicine was found:

> Specialist in Medical Practice, more especially, a physician or surgeon who applies himself to the study and practice of a particular branch of his profession.

The Supreme Court of the United States (Harry Semler *v.* Oregon Board of Dental Examiners, No. 538, October term, 1934. Decision rendered by Chief Justice Hughes, April 1935) declared that

> The legislature was not dealing with traders in commodities, but with the vital interest of public health, and with a profession treating bodily ills and demanding different standards of conduct from those which are traditional in the competition of the market place.

But the sum total of these court decisions merely gives us the possible definition that a specialist in dentistry is "one who applies himself to the study and practice of some particular branch of his profession." Your committee is not satisfied with this definition.

Equally difficult was the effort to find satisfactory answer to the question,

"What are the specialties in dentistry?" The American Dental Association gives partial answer in its Constitutional and Administrative By-Laws (Chapter XI, Sec. 17, p. 26) when, in constituting a committee on nomenclature, it designates the specialties of dental practice as exodontia, oral surgery, periodontia, orthodontia and prosthodontia. Looking about in the field of practice, the committee finds the following national societies which seem to suggest specialties in dentistry:

The American Society of Oral Surgeons and Exodontists.

The American Board of Orthodontics.

The American Board of Periodontology.

The National Society of Denture Prosthetists.

The American Association of Public Health Dentistry.

The American Society of Dentistry for Children.

It should be noted, however, that the Advisory Board for Dental Specialists, which is composed in part of representatives of the above-listed organizations, resolved at its meeting in Cleveland, Ohio on September 10, 1940

> . . . that three specialty boards be sought, one in orthodontics, one in oral surgery and exodontia and one in clinical dentistry, the last to have special subsidiary boards for periodontology, prosthodontia, dentistry for children and such other phases of clinical dentistry as may be desired.

The third question concerning the public recognition of the specialist remains to be determined after we find who is a specialist and what are the specialties. Such legislation as has been enacted does not furnish a full answer to any of our questions. Four state legislatures have enacted statutes defining regulations for the practice of dental specialists: Illinois, Tennessee, Oklahoma and Michigan. The Illinois law reads in part:

> No licensee shall announce or hold himself out to the public as a specialist or as being specially qualified in a particular branch of dentistry, unless he has been in the practice of dentistry for five years, or more, prior to making application for certificate to practice as a specialist, and has complied with the additional requirements established by the Department of Practice in that specialty of dentistry.
>
> The fact that any licensee shall announce by card, letterhead or any other printed matter using such terms as "Specialist," "Practice limited to" or "limited to Specialty of," with the name of such branch of dentistry practiced as a specialty, or shall use equivalent words or phrases to announce the same, shall be prima facie evidence that such licensee is practicing as a specialist.
>
> The Department may issue a certificate, authorizing practice as a specialist in any particular branch of dentistry, to any licensee who has complied with the requirements established for that particular branch of dentistry.

The Illinois and Tennessee laws are the same in the main, with the exception that Illinois requires five years in practice and Tennessee requires only three years. It should be noted that the foregoing laws apparently do not provide for any educational qualification above general practice other than the specialist examination. The Oklahoma law reads in part:

> No member hereof shall announce and/or hold himself out to the public as limiting his practice to, or as being especially qualified in, any branch of dentistry, without first having obtained a license therefor from the Board as hereinafter provided. The Board, upon satisfactory proof that the applicant has had a minimum of thirty semester hours of graduate work in any one of the several recognized branches of dentistry in an approved college or university, or its equivalent, to be determined by the Board, may issue a license to any member authorizing such member to hold himself out, or to announce, to the public that he is especially qualified in, or limits his practice to, or gives special attention to, any one of the

recognized branches of the dental profession. The examination shall be theoretical and practical. The theoretical examination shall be in writing and include all the subjects represented in the different branches of approved graduate schools. Written examination may be supplemented with an oral examination. A special license shall be required for the practice of each recognized branch of dentistry in order for the member to hold himself out to the public as limiting his practice to, or being especially qualified in, any branch of dentistry.

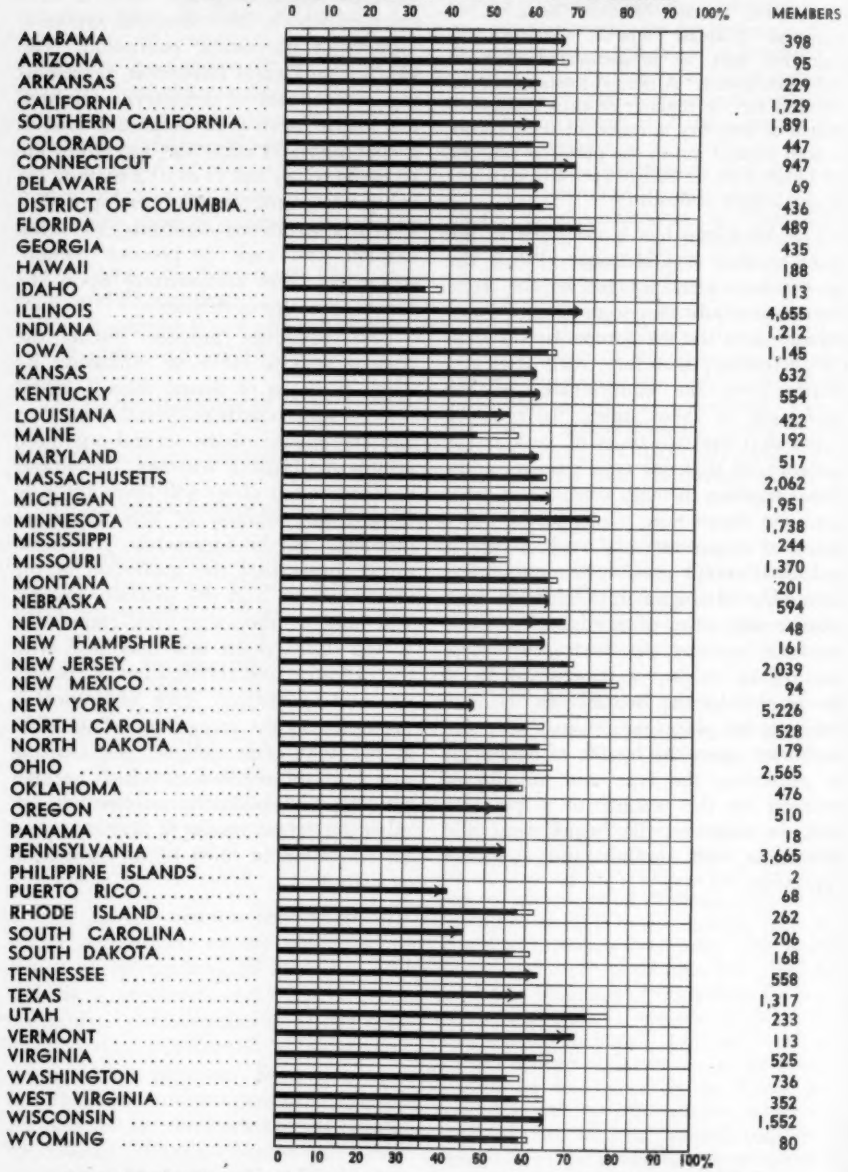
The Michigan law is the same in the main as that of Oklahoma. While the quoted laws were enacted by the legislatures, no doubt they were prepared and submitted to the legislatures by the dental profession; therefore, such laws evidently have the endorsement of the profession in these states. It is to be noted that the two types of laws are at variance, in that one type requires additional training through graduate or postgraduate instruction, while, in the other type, no requirement of such nature is included, except possibly through inference. The Michigan and Oklahoma laws require one year of graduate or postgraduate training, yet there is an exception which reads "or its equivalent, to be decided by the Board." In the final analysis, this places the responsibility and authority upon the boards of examiners to determine the type and amount of training for the practice of a specialty, and, in addition, the board must also determine the number and types of specialties.

The committee advances this preliminary report merely to point out the fact that both from the professional and from the legal angle, no policy seems to have emerged which can command universal support of the dental profession. The Council on Dental Education, representing all branches of dentistry, is perhaps the logical agency to determine who is a specialist and what the specialties are or ought to be, and to draft a method for the public recognition of the specialist. This is a serious responsibility, requiring caution and care to prevent pseudo-specialties from encroaching upon the general practice of dentistry.

The committee proposes during the coming year to make an exhaustive inquiry of deans of dental schools, members of state boards of dental examiners and the officers of the several organized groups to discover whether a cross-section of present views will point the way toward the solution of this important problem. In the meanwhile, the Committee urges that the profession in the various states, and the specialty groups, will hold in abeyance, until completion of the study, plans that may deal with the licensure and certification of specialists and specialties. This expression is prompted by the recognition of the difficulties that often follow "the freezing into law" of regulations which are not properly or adequately coordinated with other important aspects of licensure, dental education or those of the profession as a whole.

Membership Page

PERCENTAGE OF DUES RECEIVED IN CENTRAL OFFICE AS OF AUGUST 31, 1941, AS COMPARED TO 1940 MEMBERSHIP



Percentage based on dental population figures supplied by the State Society Secretaries

1941 percentage. 1940 percentage.

AMERICAN DENTAL ASSOCIATION EIGHTY-THIRD ANNUAL MEETING

HOUSTON, TEXAS, OCTOBER 27, 28, 39, 30, 31, 1941

OFFICIAL CALL

To the Members of the American Dental Association:

You are hereby notified that the Eighty-Third Annual Meeting of the American Dental Association will be held in Houston, Texas, October 27-31, 1941.

The House of Delegates will convene at 10:00 a.m., Monday, October 27. The second session will be held at 2:30 p.m., Monday, October 27; the third session at 2:30 p.m., Wednesday, October 29, and the fourth session at 2:30 p.m., Thursday, October 30. The four sessions of the House of Delegates will be held in the Ballroom of the Rice Hotel. The Credentials Committee will register Delegates and Alternates, beginning at 10:00 a.m., Sunday, October 26, at the Rice Hotel.

All other members will register at the Registration Office in the Coliseum. The Registration Department will be open from 9:00 a.m. to 5:00 p.m., Sunday, October 26, and Monday, Tuesday, Wednesday and Thursday and until noon Friday, October 27, 28, 29, 30 and 31.

The General Session which constitutes the opening exercises of the Meeting will be held Tuesday, October 28, at 9:30 a.m. The second and third General Sessions will be held Tuesday and Thursday evenings, October 28 and 30, at 8:00 p.m. The three General Sessions will be held in the Music Hall of the Coliseum.

The constituent societies are notified to file with the Secretary of this Association, at least thirty days prior to the first day of the Annual Meeting, a list of the names and addresses of their Delegates and Alternates.

WILFRED H. ROBINSON, *President.*
HARRY B. PINNEY, *Secretary.*

Committee on Local Arrangements
Willard Ogle Honorary Chairman
W. O. Talbot Honorary Chairman
J. O. Hall Honorary Chairman
W. D. McCarty Honorary Chairman
Bush Jones Honorary Chairman
J. E. Storey Honorary Chairman
C. M. Taylor Secretary and Information Chairman
O. F. Gambatti Honorary Chairman
W. H. Scherer General Chairman
O. E. Ranfranz Vice-Chairman
J. D. O'Farrell Publicity Chairman
G. M. Platt Scientific and Health Exhibits
R. H. Hooper Associated Groups
L. I. Kercheval Clinic Chairman
R. C. Cooley Reception and Transportation
F. C. Elliott Public Relations
R. A. Boelsche Ex-Officio
Glenn S. Morris Halls and Hotels Chairman
W. T. Newton Entertainment Chairman
L. A. Crabb Ex-Officio
M. R. Garrison Ex-Officio

COMMITTEE ON LOCAL ARRANGEMENTS, EIGHTY-THIRD ANNUAL MEETING OF THE AMERICAN DENTAL ASSOCIATION, HOUSTON, TEXAS, OCTOBER 27-31, 1941.

GENERAL PROGRAM

Registration (General) ..... Sunday, October 26, 9:00 a.m.
(Coliseum)

Registration (Delegates and Alternates) ..... Sunday, October 26, 10:00 a.m.
(Ballroom, Rice Hotel)

Board of Trustees (First Session) ..... Friday, October 24, 10:00 a.m.
(Rice Hotel)

Board of Trustees (Second Session) ..... Saturday, October 25, 10:00 a.m.
(Rice Hotel)

House of Delegates (First Session) ..... Monday, October 27, 10:00 a.m.
(Ballroom, Rice Hotel)

House of Delegates (Second Session) ..... Monday, October 27, 2:30 p.m.
(Ballroom, Rice Hotel)

House of Delegates (Third Session) ..... Wednesday, October 29, 2:30 p.m.
(Ballroom, Rice Hotel)

House of Delegates (Fourth Session) ..... Thursday, October 30, 2:30 p.m.
(Ballroom, Rice Hotel)

PRELIMINARY PROGRAM FOR THE HOUSTON MEETING

FIRST GENERAL SESSION

(Music Hall, Coliseum)

TUESDAY, OCTOBER 28

9:30 a.m. Music
Mrs. Harry R. McLean, organist ..... Houston, Texas

9:45 Invocation
Bishop A. Frank Smith, Methodist Church ..... Houston, Texas

9:50 Greetings from the State of Texas
Governor Coke Stevenson ..... Austin, Texas

10:00 Greetings from the City of Houston
Mayor C. A. Pickett ..... Houston, Texas

10:10 Address: "American Medicine Prepares"
Morris Fishbein, M.D. ..... Chicago, Ill.

10:50 Introduction of foreign guests

11:00 Address by the President
Wilfred H. Robinson.....Oakland, Calif.

11:30 "About Faces" (Motion Picture)
Cator Woolford.....Sterling, Ga.
J. G. Williams.....Atlanta, Ga.

Music
Mrs. Harry R. McLean, organist.....Houston, Texas

SECOND GENERAL SESSION

(Music Hall, Coliseum)

TUESDAY, OCTOBER 28

8:00 p.m. Music
Mrs. Harry R. McLean, organist.....Houston, Texas

8:15 Address: "How to Be Happy Though Educated"
Charles Milton Newcomb.....Delaware, Ohio

Music
Mrs. Harry R. McLean, organist.....Houston, Texas

THIRD GENERAL SESSION

(Music Hall, Coliseum)

THURSDAY, OCTOBER 30

8:00 p.m. Music
Mrs. Harry R. McLean, organist.....Houston, Texas

Address: "Dentistry and Social Science"
A. E. Rowlett.....Leicester, England

Address: "Team Work in Facial Injuries"
Sir Harold Gillies.....London, England

Music
Mrs. Harry R. McLean, organist.....Houston, Texas

WEDNESDAY EVENING

OCTOBER 29

DINNER DANCE

In honor of the President, Wilfred H. Robinson, Ball Room, Rice Hotel

PROBABLE HOUSTON WEATHER IN OCTOBER

71 degrees

(Light-weight fall clothes will be comfortable. Nights are always cool.)

SECTION OFFICERS—CHAIRMEN AND SECRETARIES—EIGHTY-THIRD ANNUAL MEETING OF THE AMERICAN DENTAL ASSOCIATION, HOUSTON, TEXAS, OCTOBER 27-31, 1941.

THE SCIENTIFIC SECTIONS

TUESDAY AFTERNOON, OCTOBER 28

OPERATIVE DENTISTRY, MATERIA MEDICA AND THERAPEUTICS

(Coliseum Annex, Room 3)

OFFICERS OF SECTION

Willard F. Andes, Chairman.....Huntington Building, Miami, Fla.
E. M. Jones, Vice Chairman.....122 E. 16th St., Los Angeles, Calif.
J. B. Hutcherson, Secretary.....Starks Building, Louisville, Ky.

2:30 to 5:00 p.m.

2:30 "Preparation, Condensation and Adaptation of Amalgam"
Arne F. Romnes.....Chicago, Ill.
3:15 "Silicate Cements"
William A. Garrett.....Atlanta, Ga.
4:00 "Individual Unit Porcelain Jacket Bridge"
Carlisle C. Bastian.....New York, N. Y.

FULL DENTURE PROSTHESIS

(Coliseum Annex, Room 1)

OFFICERS OF SECTION

G. E. Tilton, Chairman.....Union National Bank Bldg., Wichita, Kan.
W. W. Hurst, Vice Chairman.....2165 Adelbert Road, Cleveland, Ohio
Homer Simpson, Secretary.....Medical Arts Building, Dallas, Texas

2:30 to 5:00 p.m.

2:30 "Full Dentures—Why Must They Look That Way?" (Illustrated with Slides)
Irving R. Hardy.....New York, N. Y.
3:15 "Consideration of Denture Base Materials; Advantages, Disadvantages and a Technic for Their Use"
I. Lester Furnas.....LaJolla, Calif.
4:00 "Minute Anatomy of the Lower Jaw in Relation to the Denture Problem" (Illustrated with Slides)
Elbert Crosby Pendleton....Chicago, Ill.

PARTIAL DENTURE PROSTHESIS

(Coliseum Annex, Room 5)

OFFICERS OF SECTION

Lester E. Myers, Chairman.....Medical Arts Bldg., Omaha, Nebr.
Oliver C. Applegate, Vice Chairman.....216 S. State St., Ann Arbor, Mich.
Charles Peterka, Secretary.....LaSalle Building, Minneapolis, Minn.

2:30 to 5:00 p.m.

2:30 "Some Principles of Modern Fixed Bridge Construction"
Avery A. Bartlett.....Detroit, Mich.
3:15 "Effect of Operative Procedures on Non-Carious Teeth of Young Individuals"
William Lefkowitz.....New York, N. Y.
4:00 "Fixed Bridgework Which Meets Functional, Physiologic and Esthetic Requirements"
George M. Hollenback.....Los Angeles, Calif.

ORAL SURGERY, EXODONTIA AND ANESTHESIA

(Coliseum, Music Hall)

OFFICERS OF SECTION

Thomas Conner, Chairman.....Doctors Building, Atlanta, Ga.
J. Holden Beckwith, Vice Chairman.....Ingraham Building, Miami, Fla.
George W. Christiansen, Secretary.....David Whitney Building, Detroit, Mich.

2:30 to 5:00 p.m.

2:30 "Preoperative and Postoperative Treatments for Surgical Patients"
James R. Cameron.....Philadelphia, Pa.
3:15 "Surgical Removal of Teeth with Special Reference to the Use of Pentothal Sodium, Intravenous, in Office Practice" (Moving Picture)
Berto A. Olson.....Hollywood, Calif.
4:00 "Technic for Obtaining the Temporomandibular Joint Exposure and Simplification of Placement of Film in Difficult Areas to Prevent Distortion"
J. Holden Beckwith.....Miami, Fla.
4:20 "What Shall We Do with This Pulpless Tooth?"
Donald E. Woodard...Kansas City, Mo.

ORTHODONTIA

(Coliseum Annex, Room 4)

OFFICERS OF SECTION

Frank F. Lamons, Chairman.....Doctors Building, Atlanta, Ga.
L. B. Higley, Vice Chairman.....705 S. Summit St., Iowa City, Iowa
Frank W. Nash, Secretary.....Medical Arts Building, Scranton, Pa.

2:30 to 5:00 p.m.

2:30 "Orthodontics as a Health Service"
Walter T. McFall.....Asheville, N. C.

3:15 "Orthodontic Procedures Prior to Prosthesis"
Leonard Kohn.....Brooklyn, N. Y.

4:00 "Artificial Eruption of Malposed Teeth"
M. S. Strock.....Boston, Mass.

PERIODONTIA

(Coliseum, Second Floor, Room D)

OFFICERS OF SECTION

Lynn A. Fonner, Chairman.....
..1100 E. Creighton St., Fort Wayne, Ind.
Hunter S. Allen, Vice Chairman.....
.....Comer Building, Birmingham, Ala.
Harold J. Leonard, Secretary.....
.....630 W. 168th St., New York, N. Y.

2:30 to 5:00 p.m.

2:30 "Vitamin C in Periodontal Therapy"
Dorothea F. Radusch. Minneapolis, Minn.

3:15 "The B Complex Vitamins in Relation to Periodontal and Oral Mucous Membrane Lesions"
Thomas J. Cook.....Philadelphia, Pa.

4:00 "Histopathology of Periodontal Disease"
Bernhard Gottlieb.....Ann Arbor, Mich.

CHILDREN'S DENTISTRY AND ORAL HYGIENE

(Coliseum Annex, Room 2)

OFFICERS OF SECTION

Phillip E. Blackerby, Jr., Chairman.....
.....420 Sixth Ave., N., Nashville, Tenn.
Kenneth A. Easlick, Vice Chairman.....
..S. W. Trick Building, Ann Arbor, Mich.
Robert A. Downs, Secretary.....
.....1130 S. Gilpin St., Denver, Colo.

2:30 to 5:00 p.m.

2:30 "Objectives and Accomplishments of the American Society of Dentistry for Children"
Ralph L. Ireland.....Lincoln, Nebr.

2:50 "Rôle of Dentistry for Children in a National Health Program"
Harold W. Oppice.....Chicago, Ill.

3:15 "Analysis of Professional Opinion Concerning Current Thoughts and Trends in Dentistry for Children"
Walter J. Pelton.....Washington, D. C.

4:00 "Suggestions to the General Practitioner for the Prevention of Malocclusion"
Claude R. Wood.....Knoxville, Tenn.

4:30 Discussion
Ralph M. Erwin, Jr.....Portland, Ore.

HISTOLOGY, PHYSIOLOGY, PATHOLOGY, BACTERIOLOGY AND CHEMISTRY (RESEARCH)

(Coliseum, Third Floor, Room A)

OFFICERS OF SECTION

Harold J. Noyes, Chairman.....
.....55 E. Washington St., Chicago, Ill.
Hermann Becks, Vice Chairman.....
..Univ. of California, San Francisco, Calif.
Basil G. Bibby, Secretary.....
.....416 Huntington Ave., Boston, Mass.

2:30 to 5:00 p.m.

2:30 "Significance of Radioactive Isotopes in Dental Research"
H. B. McCauley.....Rochester, N. Y.

3:15 "Effect of Various Foods and Cleansing Agents on the Elimination of Artificially Inoculated Yeast from the Mouth"
H. T. Knighton.....Louisville, Ky.

4:00 "Postoperative Loss of the Ear and Its Construction by Prosthetic Methods"
A. H. Bulbulian.....Rochester, Minn.

WEDNESDAY MORNING, OCTOBER 29

OPERATIVE DENTISTRY, MATERIA MEDICA AND THERAPEUTICS

(Coliseum Annex, Room 3)

9:30 a.m. to 12:00 m.

9:30 "Hydrocolloid Technic for Inlays and Fixed Bridges" (Illustrated with colored movie film and slides)
A. W. Sears.....Jacksonville, Fla.

10:15 "Cavity Preparations"
L. A. Cadarette.....Detroit, Mich.

11:00 "Pathologic Vital Tooth, with Case Reports" (Illustrated with slides)
George R. Warner.....Denver, Colo.

FULL DENTURE PROSTHESIS

(Coliseum Annex, Room 1)

9:30 a.m. to 12:00 m.

9:30 "Mechanics of the Human Jaw and Its Relation to Tooth Form" (Illustrated with slides)
M. Russell Stein.....New York, N. Y.

10:15 "Balanced Functional Occlusion in Full Denture Construction" (Illustrated with slides and colored motion pictures)
L. Wood Swaggart.....Denver, Colo.

11:00 "Scientific Method in Dentistry"
Victor H. Sears.....New York, N. Y.

PARTIAL DENTURE PROSTHESIS

(Coliseum Annex, Room 5)

9:30 a.m. to 12:00 m.

9:30 "Simplifying the Construction of a Porcelain Veneer Crown"
J. Raymond Gill...San Francisco, Calif.

Topic discussion:

10:15 "Impressions for Partial Dentures"
C. O. Flagstad, Chairman.....
.....Minneapolis, Minn.
F. C. Elliott, Leader....Houston, Texas

Leading questions and problems:

1. What are the major problems associated with partial denture service?
2. What preliminary examination and records should be made prior to taking an impression for a partial denture?
3. Give some practical suggestions for the designing of partial dentures.
4. Is it possible to secure balanced occlusion and to maintain it in partial denture service?
5. How can possible injury from undue stress on abutment teeth be minimized?
6. How does partial denture service compare in efficiency with other branches of restorative dentistry?
7. State some factors in determining the length of service a partial restoration will render.
8. Discuss impression technics for partial dentures.
9. Briefly discuss the retention of partial dentures, giving the requisites of an attachment.
10. Why do partial dentures require more servicing than any other type of dental restoration?
11. State the major difficulties which develop in partial dentures and which require service, and give method of handling these difficulties.
12. When is it necessary to open the bite in partial denture cases? How can it be successfully done and maintained? What are the limitations?
13. What is the consensus of opinion regarding the base metals for partial dentures and also the substitutes for vulcanite?
14. What are the chief causes for rapid resorption of tissue under partial dentures and how is it possible to control it?
15. How should a prospective partial denture patient be advised concerning this service?

Topic discussion:

11:00 "Abutments as Applied to Fixed as Well as Removable Partial Denture Prosthesis"
E. A. Nelson, Chairman.....
.....Minneapolis, Minn.
F. W. Hinds, Leader.....Dallas, Texas

Leading questions:

1. What are the requisites of an ideal bridge abutment?
2. What is meant by the biologic considerations of a bridge abutment?
3. How do you control pain and irritation in preparing abutment teeth for retainers?
4. What considerations may assure more conservative cutting of tooth structure?
5. What type of retainers do you prefer on various teeth, and why?
6. What are the indications and contraindications for the use of inlays as bridge retainers?
7. What histologic variations must be recognized in the preparation of teeth for partial veneer crowns, especially anterior teeth?
8. How do you protect abutment teeth between the time of preparation and the final cementation of a bridge?
9. Does the technic of making wax patterns and castings have a direct bearing on the preparation of teeth to be used as bridge abutments?
10. In what other way is the casting technic important in the consideration of an abutment tooth?
11. Granted that the quality of the restoration is important in this discussion, how, briefly, can it be improved?
12. Should the gingival margins of crowns always extend below the free gum margin?
13. Would you ever consider using a devitalized tooth as a bridge abutment?
14. Why has fixed bridgework often been condemned in the past?
15. Is there ever a difference in the preparation of an abutment for a fixed and for a removable bridge?

ORAL SURGERY, EXODONTIA AND ANESTHESIA

(Coliseum, Music Hall)

9:30 a.m. to 12:00 m.

9:30 "Diagnosis of Oral Lesions"
Wilbur McL. Davis.....Orlando, Fla.

10:15 "Sulfathiazole and Its Use in Infections of the Jaw"
George C. Albright.....Greenville, S. C.

10:40 "Relations Between Oral Foci and Eye Infections"
Ray K. Daily, M.D.....Houston, Texas

11:00 "Preparation of the Mouth for Immediate Denture Service. Electrosurgery—Nitrous Oxide-Oxygen Anesthesia" (Moving Picture)
Harry M. Seldin.....New York, N. Y.

ORTHODONTIA

(Coliseum Annex, Room 4)

9:30 a.m. to 12:00 m.

9:30 "Optimal Age for Orthodontic Treatment"
Milo Hellman.....New York, N. Y.

10:15 "Study of Fifty-Eight Orthodontic Cases Five to Fifteen Years After Treatment"
George R. Moore.....Ann Arbor, Mich.
M. D. Edwards.....Montgomery, Ala.

11:00 "Public Relations in Orthodontics"
T. W. Sorrels....Oklahoma City, Okla.
Discussion:
Fred A. Richmond....Kansas City, Kan.

PERIODONTIA

(Coliseum, Second Floor, Room D)

9:30 a.m. to 12:00 m.

9:30 "Clinical Importance of Exact Diagnosis of Loose Teeth"
Emmerich Kotanyi.....Houston, Texas

10:15 "How Important Is Mouth Brushing in the Prevention of Periodontoclasia?"
Frederick A. Bricker..Los Angeles, Calif.

11:00 "Treatment of Vincent's Infection"
Isador Hirschfeld.....New York, N. Y.

CHILDREN'S DENTISTRY AND ORAL HYGIENE

(Coliseum Annex, Room 2)

9:30 a.m. to 12:00 m.

9:30 "Pulp Capping in Deciduous Teeth—Report of a Ten-Year Study"
S. N. Rosenstein.....New York, N. Y.

10:15 "Practical Application of Preventive Measures in Dentistry for Children"
Ruth Martin.....St. Louis, Mo.

10:45 Discussion:
Konrad Lux.....Waco, Texas

11:00 "Financial Failures in Dentistry for Children—Why?
John C. Brauer.....Iowa City, Iowa

HISTOLOGY, PHYSIOLOGY, PATHOLOGY, BACTERIOLOGY AND CHEMISTRY (RESEARCH)

(Coliseum Third Floor, Room A)

9:30 a.m. to 12:00 m.

9:30 "Further Studies in the Rôle of Vitamin D in the Control of Dental Caries in Children"
E. C. McBeath.....New York, N. Y.

10:15 "Does Salivary Calcium and Phosphorus Composition Differ Significantly in Caries-Free and Caries-Active Individuals?"
W. W. Wainwright.San Francisco, Calif.

11:00 "Is an Optimal Diet or a Low Carbohydrate Intake Required To Arrest Dental Decay?"
A. L. Jensen.....Berkeley, Calif.

WEDNESDAY AFTERNOON OCTOBER 29

OPERATIVE DENTISTRY, MATERIA MEDICA AND THERAPEUTICS

(Coliseum Annex, Room 3)

2:30 to 5:00 p.m.

2:30 "Gold Foil Restorations for Incipient Caries" (Illustrated with slides)
Robert E. Hampson.....Seattle, Wash.

3:15 "Roentgenographic Information of Value in Operative Dentistry"
L. R. Main.....St. Louis, Mo.

4:00 "Removal of Fluorine Stain, or So-Called Colorado Stains" (Illustrated with slides and demonstration of treatment)
H. A. Berry.....Holbrook, Ariz.

FULL DENTURE PROSTHESIS

(Coliseum Annex, Room 1)

2:30 to 5:00 p.m.

2:30 "Full Denture Impressions" (Illustrated with colored motion pictures)
Homer Simpson.....Dallas, Texas

3:15 "Anatomy of the Mouth in Relation to Complete Dentures"
L. F. Edwards.....Columbus, Ohio

4:00 "Impressions for Complete Dentures" (Illustrated with colored motion pictures)
Carl O. Boucher.....Columbus, Ohio

PARTIAL DENTURE PROSTHESIS

(Coliseum Annex, Room 5)

2:30 to 5:00 p.m.

2:30 "Where and How May Acrylics Be Used in Restorative Dentistry?"
Stanley D. Tylman.....Chicago, Ill.

3:15 "Technic for Meeting the Requirements of a Successful Lower Partial Denture"
Rolland R. Jones.....Portland, Ore.

4:00 "Importance of Systematized Prophylaxis and Its Connection with Dental Replacements"
Elbert J. Weaver.....Milwaukee, Wis.

ORAL SURGERY, EXODONTIA AND ANESTHESIA

(Coliseum—Music Hall)

2:30 to 5:00 p.m.

2:30 "Surgical Problems Involving the Mandibular Canal"
Wilton W. Cogswell.....
.....Colorado Springs, Colo.

3:15 "Technic of Handling a Well-Diversified Group of Oral Surgery Cases: Local Anesthesia" (Motion Picture)
Sanford M. Moose..San Francisco, Calif.

4:00 "Fractures of the Mandible"
Fred T. Henny.....Detroit, Mich.

ORTHODONTIA

(Coliseum Annex, Room 4)

2:30 to 5:00 p.m.

2:30 "Research in the Anatomy of the Juvenile of Practical Value to the Dental Profession"
Spencer R. Atkinson....Pasadena, Calif.

3:15 "Some Considerations About Orthodontics and Dentistry in Latin America"
Samuel Fastlicht...Mexico City, Mexico

4:00 "Orthodontic Treatment in the Mixed Denture Stage"
F. Copeland Sheldon...Kansas City, Mo.

PERIODONTIA

(Coliseum, Second Floor, Room D)

2:30 to 5:00 p.m.

2:30 "Clinical and Roentgenographic Study of Periodontic Problems in Children with Systemic Diseases"
C. H. Blackstone.....Iowa City, Iowa

3:15 "Trauma and the Partial Denture"
Edward Bartlett Spalding.....
.....Birmingham, Mich.

4:00 "Environment and Diet as They Affect Periodontal Structures"
R. Gordon Agnew.....Toronto, Canada

CHILDREN'S DENTISTRY AND ORAL HYGIENE

(Coliseum Annex, Room 2)

2:30 to 5:00 p.m.

2:30 "Rôle of the Private Practitioner in Public Health Dentistry"
Leo J. Schoeny.....New Orleans, La.

3:00 Discussion:
Richard C. Leonard.....Baltimore, Md.

3:15 "Public Health Dentist's Responsibilities to the Private Practitioner"
R. C. Dalgleish....Salt Lake City, Utah

3:45 Discussion:
Lon W. Morrey.....Chicago, Ill.

4:00 "Dentist's Place in Community Health Education"
Vivian V. Drenckhahn.....
.....Battle Creek, Mich.

HISTOLOGY, PHYSIOLOGY, PATHOLOGY, BACTERIOLOGY AND CHEMISTRY (RESEARCH)

(Coliseum Third Floor, Room A)

2:30 to 5:00 p.m.

2:30 Periodontia Round Table
Kurt H. Thoma.....Boston, Mass.
Bernhard Gottlieb.....Ann Arbor, Mich.
Balint Orban.....Chicago, Ill.
Thomas J. Cook.....Philadelphia, Pa.
Rowe Smith.....Texarkana, Ark.
Willard C. Fleming.....Oakland, Calif.
Michael J. Walsh.....San Diego, Calif.
John Oppie McCall....New York, N. Y.
Samuel Charles Miller..New York, N. Y.

THURSDAY MORNING
OCTOBER 30

OPERATIVE DENTISTRY, MATERIA MEDICA AND THERAPEUTICS

(Coliseum Annex, Room 3)

9:30 a.m. to 12:00 m.

9:30 "Use of the Sulfonamide Drugs in Dental and Oral Diseases"
Raymond L. Gregory, M.D.....
.....Galveston, Texas

10:15 "Clarification of Our Concept of Cause, with Practical Suggestions for the Control of Dental Caries"
Milton T. Hanke, Ph.D.....Chicago, Ill.
One hour for questions and answers.
Business session and election of officers.

FULL DENTURE PROSTHESIS

(Coliseum Annex, Room 1)

9:30 "Lower Denture Stabilization by Impression" (Illustrated with slides and colored motion pictures)
Howard H. Montgomery and
Allan J. Burgess.....Los Angeles, Calif.

10:15 "Injection Molding of Plastics for Dentures" (Illustrated with slides)
Walter J. Pryor.....Cleveland, Ohio

11:00 "Forty Minutes of Full Denture Construction" (Illustrated with colored motion pictures)
Bert L. Hooper.....Lincoln, Nebr.
Business session and election of officers.

PARTIAL DENTURE PROSTHESIS

(Coliseum Annex, Room 5)

9:30 a.m. to 12:00 m.

9:30 "Why and How Cuspal Harmony in the Lateral Ranges?"
B. C. Kingsbury....San Francisco, Calif.

10:15 "Base Metal Alloys: Physical and Chemical Properties"
George C. Paffenbarger.....Washington, D. C.
11:00 Business session and election of officers.

ORAL SURGERY, EXODONTIA AND ANESTHESIA

(Coliseum—Music Hall)

9:30 a.m. to 12:00 m.

9:30 "Fractures of the Jaws"
Franz William Stumpf.....San Antonio, Texas
10:15 "The Heart from the Standpoint of the Dental Patient and Dentistry"
P. M. Bassel, M.D.....Temple, Texas
11:00 "Traumatic Injuries of the Maxilla and the Malar and Nasal Bones"
John B. Erich, M.D....Rochester, Minn.
Business session and election of officers.

ORTHODONTIA

(Coliseum Annex, Room 4)

9:30 a.m. to 12:00 m.

9:30 "Use and Abuse of the Guide Plane in the Treatment of Class II Cases"
Oren A. Oliver.....Nashville, Tenn.
10:15 "Treatment of Cases Using the Johnson Twin Wire Appliances"
John A. Atkinson.....Louisville, Ky.
11:00 "Choice of Appliances"
George S. Callaway....New York, N. Y.
11:25 "The Child, the School and Dental Treatment"
Frank W. Nash.....Scranton, Pa.
Business session and election of officers.

PERIODONTIA

(Coliseum Second Floor, Room D)

9:30 a.m. to 12:00 m.

9:30 "Home Care Instruction of the Periodontal Patient"
J. A. Jacobsmeyer.....St. Louis, Mo.
10:15 "Surgery's Place in the Treatment of Periodontoclasia"
Arthur H. Merritt.....New York, N. Y.
11:00 "Subgingival Curettage"
Dickson G. Bell....San Francisco, Calif.
Business session and election of officers.

CHILDREN'S DENTISTRY AND ORAL HYGIENE

(Coliseum Annex, Room 2)

9:30 a.m. to 12:00 m.

9:30 "Growth and Development Problems in Dentistry for Children"
Kenneth A. Easlick...Ann Arbor, Mich.
10:15 "Medicodental Relations in the Treatment of Children"
John K. Glen, M.D.....Houston, Texas
11:00 "Prevention and Control of Dental Caries" (Motion picture in color)
University of California.....San Francisco, Calif.
11:40 Business meeting and election of officers.

HISTOLOGY, PHYSIOLOGY, PATHOLOGY, BACTERIOLOGY AND CHEMISTRY (RESEARCH)

(Coliseum Third Floor, Room A)

9:30 a.m. to 12:00 m.

9:30 "Caries Immunity in Deaf Smith County, Texas"
Edward Taylor.....Austin, Texas
10:15 "Study of Mottled Teeth in Mexico"
Ramon Cordova....Mexico City, Mexico
10:45 "Serving the Profession and the Public; A Problem in Dental Research"
Harold L. Hansen.....Chicago, Ill.
11:15 "A Challenge to Opponents of Non-Vital-Teeth and Root-Canal Surgery"
S. Marshall Weaver.....Cleveland, Ohio
Business meeting and election of officers.

GENERAL CLINIC PROGRAM

THURSDAY AFTERNOON AND FRIDAY, OCTOBER 30-31

SECTION CLINICS

Full Denture Prosthesis

"Variations and Polyisomerism of the Human Dentition"
M. Russell Stein.....New York, N. Y.
"Lower Dentures—Analyses by Measurements and Tray Fitting; Also Introducing a Soft Denture Base"
Howard H. Montgomery and
Allan J. Burgess.....Los Angeles, Calif.

Partial Denture Prosthesis

"Some Principles of Modern Fixed Bridge Construction"
Avery A. Bartlett.....Detroit, Mich.

"Fixed Bridgework Which Meets Physiologic and Esthetic Requirements"
George M. Hollenback.....Los Angeles, Calif.

"Simplifying the Construction of a Porcelain Veneer Crown"
J. Raymond Gill...San Francisco, Calif.

"Analysis of the Stresses of Lower Partial Dentures"
Rolland R. Jones.....Portland, Ore.

"A Definite Technic and Procedure in Prophylaxis, and Ideas Relating to the Permanency of Abutments for Replacement Work"
Elbert J. Weaver.....Milwaukee, Wis.

Orthodontia

"The Coil Spring and Its Practical Application"
Louis Goldberg.....Englewood, N. J.

"Cases That Should Be Treated as Soon as Irregularity Is Manifested"
Eva R. Hastings.....Des Moines, Iowa

"Bite-Blocks Used in Conjunction with Appliances in the Treatment of Anterior Occlusion"
Charles F. Russell.....Waco, Texas

"Chrome Anterior Band Construction and Attachments"
Howard Yost.....Grand Island, Nebr.

"Minimal Orthodontic Procedures of Proven Value"
M. D. Edwards.....Montgomery, Ala.

"A Method of Closing Spaces"
Walter E. Lipscomb.....Houston, Texas

"Disturbance of Occlusion Following Extraction"
Willis H. Grinnell.....Boston, Mass.

INDIVIDUAL AND GROUP CLINICS

Arizona

"Instrument Sharpening"
John A. Lenz.....Phoenix
Melvin V. Saxman.....Phoenix

"Thirty-Five Orthodontic Cases"
William M. Tweed.....Phoenix

Illinois

"Intravenous Anesthesia"
Paul L. Lane.....Chicago

"Processing of Inlays in Acrylic Resin with Special Emphasis on the Restoration of the Incisal Angle" (Direct method)
C. E. Waterman.....Chicago

"Registration of Centric Relation in Full Denture Construction" (A practical demonstration)
Peter B. Christensen.....Chicago

"A New Approach to the Problem of Occlusion in Denture Construction"
J. M. Hirsch.....Chicago

"Treatment and Management of Fractures in Edentulous Mandibles"
Ralph C. Rudder.....Chicago

"Value of Routine X-Ray Examination and Its Relation to Oral Diagnosis"
Charles E. Lauder.....Monmouth

"Hand Chisel Technic as an Aid in Routine Extraction"
James H. Keith.....Evanston

"Gold Foil in Small Accessible Cavities"
W. E. Harper.....Winchester

"Roach Partial Denture Fundamentals"
R. M. Morange.....Chicago

"Practical Treatment of Periodontia and Trench Mouth for the General Practitioner"
S. H. Goodfriend.....Chicago

"Demonstration of a Twin-Tooth Pontic in the Construction of an All Porcelain Bridge"
A. H. Tamarin.....Chicago

"Esthetic Factors in Complete Denture Construction"
Earl L. Richey.....Rockford

"Immediate Gold Inlays and Mechanical Bridge Fixation"
David W. Phillips.....Chicago

"Esthetics According to Nature's Plan and How To Conform to It in Our Dentures"
Walter D. Raber.....Chicago

"Physiology in Children's Dentistry"
Lester I. Webb.....Harrisburg

"Arch Alinement with Porcelain"
Henry L. Boris.....Chicago

"Helpful Suggestions in the Use of Synthetic Porcelain Fillings"
Frank E. Farrell.....Chicago

Indiana

"Opening the Bite with a Removable Bridge"
J. B. Carr
J. D. Carr.....Indianapolis

"Permanent Liner for Acrylic Dentures Without Processing
A. P. Craig.....Gary

Iowa

"Full Upper and Lower Dentures"
Carl T. Ostrem.....Des Moines
Forrest A. Barnes.....Ames

"One Piece Orthodontic Casting"
C. Herman Stewart.....Farragut

"Impressions, Jaw Relations and Set-Up"
C. E. Carl.....Waterloo

"Immediate Denture Technic"
Lloyd F. Bailey.....LaPorte City

"Medication in Dentistry"
G. M. Boysen.....Waterloo

Kentucky

"Acrylics for Inlay, Crown and Bridge Work"
J. Irwin Essig.....Louisville

"Hydrocolloids in Inlay, Crown and Bridge Work"
Elam Harris.....Louisville

"Fixed Bridges in One Piece Castings"
Lyman L. Duley.....Paducah

"Immediate Dentures"
R. I. Todd.....Richmond

Massachusetts

"Therapeutics in Dentistry"
Arthur T. Palmer.....Lynn

"Fundamental Principles in Flap Design"
Richard A. Soja.....Fall River

Title to come
G. M. Teasdale.....New Bedford

"Monthly Prophylaxis—A Definite Procedure of Prevention for the Child Patient"
Harold J. Cronin.....Springfield

Michigan

"Soft Tissue Surgery in Relation to the Removal of Fractured Roots"
B. E. Luck.....Lansing

"Correction of Traumatic Occlusion in Both Natural and Artificial Dentures"
Russell I. Vietor.....Grand Rapids

"Use of Local Anesthesia in Children's Dentistry"
W. H. Phillips.....Detroit

Mexico

"New Intra-Oral Nerve Blocking Technic"
Sergio Varela.....Mexico City

Minnesota

"Use of an Intra-Oral Guide and Tracer in Setting Up of Upper and Lower Dentures"
E. G. Lang.....New Ulm

"Full Upper Impression, Modeling Compound-Plaster Technic"
C. P. Allison.....Minneapolis

"Grinding Teeth to Relieve Excessive Stress"
E. W. Plonty.....Minneapolis

"Dental Drugs and Their Uses"
Paul E. Weston.....Minneapolis

"Surgery in Dentistry"
B. L. Maertz.....Willmar

"Uses of Perma-Form in Denture Construction"
C. G. Girvin.....Mankato

"Analysis of the Mechanics Involved in Partial Veneer Crown Construction"
W. E. Jones.....St. Paul

"Simplifying Children's Dentistry with the Child's 'Make Tricks' Retainer"
W. A. Dvorak.....St. Paul

"Evolution of Toothbrush Manipulation—Manual Vs. Motorized Aids"
P. O. Rosendahl.....Minneapolis

"Balance and Function in Full Denture Construction"
Fred C. Brown.....St. Paul

"Modeling Compound Technic of a Full Upper Impression"
Victor O. Nelson.....Minneapolis

"Fractures of the Mandible"
L. R. Weiss.....Minneapolis

"Can the Generated Path Be Shown To Be the Most Scientific and Accurate Means of Obtaining Balance and Function?"
Fred S. Meyer.....Minneapolis
William J. Von Bank.....New Ulm
Joseph B. Towey.....Minneapolis

"Direct Bridge Work"
George A. E. Betker.....Winona

Mississippi

"Efficient Alkaline Local Anesthetic"
R. C. Stowers.....Natchez

Group Clinic

"Bread and Butter Dentistry for the Average Practitioner"
Claude Moore Study Club

"Simplifying Removal of Impacted and Difficult Teeth; New Attachment for Impactor; Prevention of Dry Sockets; Immediate Relief for Dry Sockets"
C. A. Moore.....Lexington

"Delayed Delivery in Extraction of Difficult Teeth To Practically Eliminate Fractured Roots and Undue Trauma"
M. B. Pierce.....New Albany

"Angulation"
F. C. Sneed.....Osyka

"Processing"
D. C. Easley.....McComb

"Interpretation and Diagnosis"
O. L. Colee.....Magnolia

"Detailed Instructions in Technic of Amalgam Manipulation"
C. R. Russ.....Jackson
D. C. Williams.....Brookhaven
H. H. Parker.....Lucedale
C. A. Ray.....Meridian

Missouri

"Color Photography"
M. T. Curran.....Kansas City

"Method of Attaching Vulcanite Teeth to Gold"
F. Hubert Eversull.....Kansas City

"Simplified Impression Technic for Immediate Dentures"
Otho Duncan.....Kansas City

"Permanent Registration for Predentulous Patients"
Francis M. Hayden.....St. Louis

Group Clinic
Washington University, St. Louis, Mo.

"Guiding Denture Growth"
George H. Herbert.....St. Louis

"Partial Dentures"
Charles S. Kurz.....Carlyle, Ill.

"Exodontia Specimens"
William B. Spotts.....St. Louis

Montana

"Fractures of the Jaws"
John J. Hall.....Helena

Nebraska

"Models and X-Ray Films Showing Actual Cases of Fractured Jaws"
R. J. Yechout.....Omaha

"Orthodontia Case Showing Both Maxillary Cuspids Unerupted and Nearly in Contact in Palate; X-Ray Films, Progress Models and Other Data Showing Case Before, During and After Treatment"
A. M. Dunn.....Omaha

"Controlling Discoloration in the Use of Ammoniacal Silver Nitrate"
C. E. Baker.....David City

"Taking Impressions and Relining, Using Pressure Method"
J. F. Sheehan.....Omaha

Group Clinic
Central Nebraska Study Club

"Complete Denture Service with Balanced Functional Occlusion"
F. T. Daly.....Cambridge
J. G. Colgan.....McCook
A. R. Transue.....Lexington
F. O. Raasch.....Kearney
K. E. Sayles.....Overton
G. V. Reynolds.....Lexington
A. T. Ridder.....Callaway
L. R. Beattie.....Ainsworth

Group Clinic
Dental Faculty of the College of Dentistry, University of Nebraska

"Orthodontia"
Paul G. Ludwick.....Lincoln

"Children's Dentistry"
Ralph L. Ireland.....Lincoln

"X-Rays and Diagnosis"
William I. Rotton.....Lincoln

"Gold Foil"
Lester E. Myers.....Omaha

"Gold Foil"
Guy L. Spencer.....Lincoln

"Inlays"
Donald A. Keys.....Lincoln

"Amalgam"
G. William Ferguson.....Lincoln

"Dental Medicine"
F. A. Pierson.....Lincoln

"Pathology"
Fred W. Webster.....Lincoln

"Periodontia"
B. F. Schwartz.....Lincoln

"Oral Surgery"
Ferdinand Griess.....Lincoln

"Crown and Bridge"
Ray M. Knapp.....Lincoln

"Partial Dentures"
Ormond F. Cross.....Lincoln

"Complete Dentures"
T. A. Trumble.....Lincoln

"Visual Education"
B. L. Hooper.....Lincoln

"Practice Management"
L. T. Hunt.....Lincoln

"Public Health"
J. R. Thompson.....Lincoln

New York

"Roentgenographic Interpretations in Surgical Procedures"
Earle M. Crysler.....Watertown

"Analgesia"
Morris Fierstein.....Queens Village

"A New Technic for Filling the Pulp Canals of Anterior Teeth"
John H. Parmelee.....Livonia

North Carolina

"Percentage System in Dentistry"
L. D. Arthur.....Charlotte

"Cysts and Osteomyelitis" (Motion picture)
Grady L. Ross.....Charlotte

"Removing Stains from Mottled Enamel" (Motion picture)
W. H. Breeland.....Belmont

"Acrylic Resin Bridges, Jackets and Inlays"
A. C. Current.....Gastonia

North Dakota

"Treatment of Exposed Pulps—Pulp Capping"
E. H. Lier.....Casselton

"Something New in Inlay Casting Technic"
W. E. Hocking.....Devils Lake

Ohio

"Injector Method of Processing Acrylic Dentures"
Walter J. Pryor.....Cleveland

"Immediate Dentures"
W. W. Hurst.....Cleveland

"Prosthesis"
C. O. Boucher.....Columbus

Pennsylvania

"Denture Construction in Protrusion in Regard to Comfort to the Tissues in the Glenoid Fossa and Face Lifting"
Rudolf Klicka.....Pittsburgh

South Dakota

"Pneumatic Condensor for Amalgam Fillings"
Charles L. Nelson.....Brookings

Tennessee

"Simple Method of Balancing the Occlusion in Full Dentures"
J. Benton Neil.....Nashville

"Impressions for Full Dentures"
Harvey C. Reese.....Nashville

Washington

"Why Use Checkbites if the Articulator Cannot Be Adjusted to Them?"
C. J. Stansbery.....Seattle

Wisconsin

"Functional Occlusion for Full Dentures"
H. M. Uebele.....Milwaukee

"Functional Occlusion for Fixed Bridge Work"
D. P. Nachazel.....Milwaukee

"Some Diseases of the Mucous Membrane of the Mandible and Maxilla—Pathology and Treatment"
T. A. Hardgrove.....Fond du Lac

American Dental Assistants Association

Alabama

"Porcelain Technic"

"Dental Assistant's Part in the Treatment of Vincent's Infection"—Alabama Dental Assistants Association

California

"For Your Patient's Comfort"

"Hands"—Northern California Dental Assistants Association

"Strengthening That Weak Link—Cement"

"Inlay Investing"

"Roentgenogram Time Savers"—Southern California Dental Assistants Association

District of Columbia

"Surgical Aids"

"A Star for Each Child"—District of Columbia Dental Assistants Society

Florida

"Pouring and Trimming Plaster, Stone and Investment Models"—Florida State Dental Assistants Association

Indiana

"Preparation of Colloid Impressions"

"A Dental Assistant's Library"—Indiana State Association of Dental Assistants

Iowa

"Care of Radiodontic Survey Equipment"

"Little Things That Count in Personal Appearance"

"Better Business Letters"—Iowa State Dental Assistants Association

Kansas

"Here and There in the Dental Office"—Kansas State Dental Assistants Association

Massachusetts

"Dental Office Management"—Massachusetts Dental Assistants Association

Minnesota

"Assistance for the Assistant"—Minnesota Dental Hygienists and Assistants Association

Missouri

"Acrylics"

"The Assistant's Service to the Patient"—Missouri State Dental Assistants Association

Nebraska

"Visual Aids in Children's Dentistry"

"Drawer Hints"—Nebraska Dental Assistants Association

Ohio

"The Assistant's Knowledge of Dental Medicine"

"Inlay Investment"

"Building and Baking Porcelain"

"Study Model Technic"

"Copper Plated Inlay Models"—Ohio State Dental Assistants Association

Pennsylvania

"Helpful Hints in a Dental Office"—Philadelphia Association of Dental Assistants

"The Dental Assistant's Idea Market"—Pittsburgh Dental Assistants Association

Rhode Island

"The Dental Assistant as a Laboratory Technician"—Rhode Island Dental Assistants Society

Tennessee

"Short Cuts to Efficiency"—Tennessee Dental Assistants Association

Texas

"Preparing and Packing Reformulated Hydrocolloid"

"Acrylic Retainers in Orthodontics—Laboratory Technic"—Texas State Dental Assistants Association

Wisconsin

"A Day with the Dental Assistant"—Wisconsin State Dental Assistants Association

American Dental Hygienists' Association

Florida

"What a Dental Hygienist Sees in the Face"
Frankie Campbell.....Tampa
Juanita Stocks.....Miama

"How To Demonstrate a Toothbrushing Technic to the Patient"
Virginia Fagan .....Miami

Michigan

"The Dental Hygienist's Day"
Virginia Bowlby .....Detroit
Maxine Jacobson .....Detroit

Minnesota

"Brushem and Daily Circus"
Marjorie Gormican .....Minneapolis
Elizabeth Ferm .....Minneapolis

Pennsylvania

"Stream Lining School Dental Hygiene" (Brentwood School District, Pittsburgh, Pa.)
Ida Mae Stilley.....Pittsburgh

"Dental Hygienist in Pennsylvania"
Camille Overpeck .....Philadelphia

New York

"Dividends in School Attendance Through Dental Health Education"
Frances A. Stoll.....Garden City

Texas

"The Dental Hygienist in Texas"
Leona Dunlap.....San Antonio

Wisconsin

"A School Dental Health Program Conducted by a Public Health Dental Hygienist"
Betty Krippene .....Sheboygan

TWELFTH DISTRICT CLINICS

"Full Dentures"
Roy V. Woolwine....Fort Worth, Texas

"Upper and Lower All Compound Impression Technic"
Carl H. Schwedes.....Weslaco, Texas

"Use of Pins in Restoration Dentistry"
F. W. Hinds.....Dallas, Texas

"Disclosing Decay by Staining"
K. R. Durham.....Tahoka, Texas

"Unique Method of Developing Dental X-Ray Films"
L. E. Duncanson.....Hobart, Okla.

"A Short Cut in Three-Quarter Crown Pattern Technic"
W. K. Waltmon.....Hearne, Texas

"Five Years of Preventive Dentistry by Means of Stress Reduction"
A. M. Bradley.....Muskogee, Okla.

Group Clinic

"Amalgam Fillings, Gold Inlays and Alloy Inlays"
W. R. Moody
A. A. Moody
W. R. Moody, Jr.
Mrs. W. R. Moody.....Amarillo, Texas

"Root Canal Procedure and Root Resection When Indicated"
L. A. Lucas.....Oklahoma City, Okla.

"Pulpless Tooth Procedures"
W. H. Ellis.....Shawnee, Okla.

"Mouth Shield"
P. G. Spencer.....Waco, Texas
O. H. McCarty.....Tulsa, Okla.
O. L. Voigt.....Waco, Texas

"The pH and Phosphatase Relationship to Healing Bone in Tooth Sockets"
Milton S. Taubman.....
.....Oklahoma City, Okla.

"Practical Periodontia for the Busy Dentist"
George R. Lindsay.....Denver, Colo.

"Dental Anomalies"
E. W. Darilek.....Seguin, Texas

"Pressure Casting Acrylic Dentures"
E. R. Drozd.....Three Rivers, Texas

"Thermotrol Castings"
G. E. Roland.....Oklahoma City, Okla.

"Wax Impression Technic for Inlay and Three-Quarter Crowns, with Special Attention to the Problem of Getting the Liquid Wax into the Holes for Cast Pins"
W. H. Cooper....Oklahoma City, Okla.

"Terminal Alcohol Injections for Tic Douloureux"
H. L. Bunker.....Junction City, Kan.

"X-Ray and Bacteriologic Evidence of Root-Canal Treatment Covering a Period of Fifteen Years"
Ben A. Murray.....Denver, Colo.

"Crown and Bridge"
B. B. Weldon.....Fort Worth, Texas

"An Impression Technic: Forming of Models for Movable Soft Tissue Ridges and Undercuts"
Oscar W. Gruenewald.....
.....Garden City, Kan.

"Head Gear for First Aid Treatment of Fractured Jaws"
Harry H. Sorrels..Oklahoma City, Okla.

"Armamentarium for and Demonstration of an Alkaline Local Anesthetic"
Clinton L. Stalker.....Topeka, Kan.

"Increasing the Possible Denture Foundation Area by Surgical Means"
V. C. Smedley.....Denver, Colo.

"Management of Deciduous Teeth in Public Health Work"
Lee E. Blackwood.Corpus Christi, Texas

"Restorative Dentistry" (Illustrated)
Walter J. Wyrick.....Texarkana, Ark.

"Some Steps in the Stabilizing of a Lower Denture"
Leon L. Osborn..Medicine Lodge, Kan.

Joint Clinic

"X-Rays for the General Practitioner"
John H. Becker.....Denver, Colo.
W. E. Moyer.....Denver, Colo.

"Educational Recall"
Galen R. Dean.....McPherson, Kan.

"Fracture of Edentulous Mandible"
H. C. Berry.....Little Rock, Ark.

"Construction of Acrylic Denture with Clear Palate"
W. S. Vaughan.....Mangum, Okla.

"Synthetic Porcelain Technic"
Henry W. Cornick.....Austin, Texas

"Hitting the Bull's Eye in Patient Education"
Hubert Donnelly.....Parsons, Kan.

"Caries Susceptibility Determination"
Charles A. Scrivener.....Ottawa, Kan.

"Vacuum Inlay Investing and Casting"
Roy E. Barr.....Childress, Texas

"Improvement of the Symmetrical End Arrangement of the Anterior Teeth for Better Function and Appearance"
L. Alton Neil.....El Paso, Texas

"Fractures of the Jaws and Treatment"
W. F. Haile.....Austin, Texas

"Definite Lowering of Chair Time Factor in Preparing Abutments for Fixed Bridges"
J. Wiltz Emmer.....New Iberia, La.

"Orthodontia Problems"
W. R. Alstadt.....Little Rock, Ark.

"Dental Caries Control in Orthodontic Correction"
Phelps J. Murphey.....Dallas, Texas

"Use of a Mandibular Articulator and Milling Machine"
J. Earl Scott.....Pratt, Kan.

"Impression Technic for Inlays Using Hydrocolloid"
H. Arthur Zappe..Mineral Wells, Texas

"Cause and Effect in Periodontal Disease"
R. L. Shaw.....San Antonio, Texas

"Modified Cantilever Bridges, Restoring First Molars"
W. O. Talbot.....Fort Worth, Texas

"Plastic Restorations in Dentistry"
O. S. Somers.....Emporia, Kan.

"Some Phases of the Fish Technic for Difficult Lower Dentures"
F. C. Holmes.....Mangum, Okla.

"Immediate Denture and Alveolectomy"
Hazel B. Wooden...San Antonio, Texas

"Application of the Laws of Articulation, Demonstrated by Laboratory Procedures"
J. M. McMinn.....Dallas, Texas

"Color Photography"
Louis M. Fleisch.....Topeka, Kan.

"Acrylic Dentures Without the Use of Foil"
I. M. Lightner.....Guymon, Okla.

"Casting of Inlays"
Eric Beringer.....Waco, Texas

"Intra-Oral Drainage for Diffused Infection of Lower Third Molar"
Walter C. Hava.....New Orleans, La.

"Placing of Amalgam (Silver Plastic) Fillings"
Eugene V. Wood.....Dallas, Texas

"A Simple Method in Full Denture Construction Assuring Occlusal Balance Before Insertion, Eliminating all Adjustments in Mouth and Using the Dual Check Articulator"
Sidney C. Fournet....New Orleans, La.
Gerard T. Johnson....New Orleans, La.

"Cavity Preparation and Manipulation of Gold Foil"
G. D. Lacey.....Dallas, Texas

"Second Division Block"
Clarke N. Mertz.....Topeka, Kan.

"Full Upper and Lower Dentures: Simplified Precision Technic Suitable for the General Practitioner"
Fred J. Swisher.....Denver, Colo.

"Time Saving Construction of Inlays and Cast Crowns by the Direct-Indirect Technic"
M. F. Jarrell.....Alexandria, La.

"Handling Denture Acrylics"
C. E. Cordova....Corpus Christi, Texas
Oscar A. Darilek.....Moulton, Texas

Group Clinic

Panhandle (Texas) District Study Club

"Amalgam, Radiodontics and Surgery"
George G. Ingham.....Amarillo
R. F. McCasland.....Tulia
E. J. Cundiff.....Canyon
J. B. Landers.....Amarillo
R. P. Parcells.....Amarillo
W. I. Dinan.....Amarillo
F. W. Dodson.....Amarillo
R. L. Rogers.....Amarillo
Bob Younger .....Amarillo
W. M. Curl.....Amarillo
W. B. Stevenson.....Amarillo
Stuart W. Browning.....Amarillo
John W. Makeig.....Amarillo
W. E. Gibbon.....Amarillo
F. Q. Kelleam.....Amarillo
H. R. Beck.....Clarendon
R. J. Harville.....Dumas
Waldo Beckley .....Borger

"Treatment of Pyorrhea by Surgery"
P. J. Fenley.....Houston, Texas

"Pulp Stones"
Alfred J. Selness.....Houston, Texas

"Porcelain Incisal Edge on Steel Facings"
W. C. Barth.....Houston, Texas

"Improved Lower Denture Base Vs. the Common Variety"
W. T. Jacobs.....Muskogee, Okla.

"Cast Male-Female Attachments for Partial Dentures and Fixed Bridgework"
Ralph J. Thornton.....Dallas, Texas

"Use of Celluloid Forms"
I. J. Liss.....Houston, Texas

"Oral and Dental Manifestations of Leprosy"
Bernard M. Prejean.....Carville, Ia.

"Removal of Flourine Stains from Enamel by Bleaching"
D. O. Hollingsworth...Plainview, Texas

"Simple and Inexpensive Method for Retaining Deciduous Teeth"
H. D. Mosier.....Herington, Kan.

"Opportunity for Dentist with X-Ray Equipment in Small Town"
J. A. Foster.....Homer, La.

"Models, Appliances and Photographs" (Orthodontia)
A. M. Schutzman.....Baton Rouge, La.

"Crown and Bridge"
Irvin A. Worhol.....Houston, Texas

"Orthodontic Treatment of Impacted Cuspids and Central Incisors"
A. P. Westfall.....Houston, Texas

"Hollow Gold Inlays"
J. B. Veale.....Houston, Texas

"Dental Materials"
Robert E. Baer.....Houston, Texas

"Ball and Socket Broken Stress Bridges"
W. B. Kessler....Oklahoma City, Okla.

"Surgical Preparation of the Mouth for Full Dentures"
Paul E. Finley.....Bogalusa, La.

"Extracting Third Molars"
C. K. Ray.....Vivian, La.

"Surgical Elimination of Pyorrhea Pockets"
G. R. Oden.....San Antonio, Texas

"A Ceramic Restoration"
John E. Robinson...San Antonio, Texas

"Cases of Torus Palatinae"
J. P. Wahl.....New Orleans, La.

"Results of Pyorrhea Treatment. Curettement and Conservative Electrocoagulation" (Lantern slides)
Virgil A. A. Robinson.New Orleans, La.

"New Tray for Taking Impressions for the Construction of Lower Partial Denture Cases"
Slattery C. Aleman....New Orleans, La.

"Fractures of the Maxilla and Mandible"
A. C. Sloan.....Dallas, Texas

"Immediate Dentures"
Eugene L. Brown....Fort Worth, Texas

"Amalgam Fillings and Synthetic Porcelain Under Pressure"
E. S. Park.....Jacksonville, Texas

"Home-Made Water Cooled Trays for Hydrocolloid Impressions"
W. L. Wier.....Austin, Texas
R. T. Weber.....Austin, Texas

"Cantilever Bridge with Baked Porcelain Saddle"
Ira Blake.....San Antoino, Texas

"Application of Electrical Adaptation and Spot Welding to Prosthetic Dentistry"
Archie B. Brusse.....Denver, Colo.

"Pins and Postage Stamps in Dentistry; Vertical Dimensions; Proper Method of Selecting Artificial Teeth for Full and Partial Cases"
J. E. Storey.....Beaumont, Texas

"Semidirect Inlay Technic"
J. P. Arnold.....Houston, Texas

"Impression Technic for Lower Dentures Obtaining Maximum Retention Without Compressing Tissues"
J. W. Deaton.....Texarkana, Ark.

"Vincent's Treatment"
Norbert E. Perret.....Jeanerette, La.

"Impression of the Lower Jaw"
J. Ben Herring....Oklahoma City, Okla.

"Bridge Abutments for Anterior Teeth"
A. L. Jones.....Paris, Texas

Group Clinic

Colorado Prosthetic Club and Denver Study Club

"Functional Occlusion in Full Lower Prostheses"
M. F. Bryant.....Colorado Springs
George H. Jackson.....Denver
Beryl Ritchey.....Colorado Springs
J. C. Rosnik.....Denver
H. D. Stanwood.....Denver
O. G. Schwartz.....Denver
L. Wood Swaggart.....Denver

"Simplified Balanced Gothic Arch Bite"
J. D. Mills.....Oklahoma City, Okla.

"Copper Amalgam Dies for Indirect Restorations"
Arthur J. Buff.....Topeka, Kan.

"Cleft Palate and Cleft Lip Correction"
Franz William Stumpf.....
.....San Antonio, Texas

"Three-Quarter Crowns and Compound Gold Inlays; Direct-Indirect Technic"
Frederick J. Wolfe....New Orleans, La.

"Amalgam Restorative Technic"
W. H. Louwien.....Dallas, Texas

"Nitrous Oxide Analgesia"
J. M. Holt.....San Antonio, Texas

"Cast Restorations from Hydrocolloid Impressions"
J. D. Hart.....Wewoka, Okla.

"Making X-Ray Mounts That Meet Requirements of Every Case"
A. H. Brown.....Denver, Colo.

"Using Anatomy in Mounting Casts"
Paul C. Kromer.....Yorktown, Texas

"Gold Inlays—Indirect Method"
Wilton W. Cogswell, Jr.....
.....Colorado Springs, Colo.

"Fixed Bridges with Porcelain Pontics"
J. E. Brown.....Oklahoma City, Okla.

"Nitrous Oxide Analgesia"
F. Harold Wirth.....New Orleans, La.

"Lower Impression Technic"
Taylor M. Wheat...San Antonio, Texas

"Cast Gold Crown"
J. H. Gleason.....Houston, Texas

"Cast Crowns by a Different Technic"
Stuart E. Hays.....San Antonio, Texas

"Treatment of Congenital Fibromatosis"
H. F. Gillard.....Houston, Texas

"Cast Space Retainer"
O. Harrell Jones.....Houston, Texas

Group Clinic

"Study in Denture Esthetics"
F. L. Dillard.....Houston, Texas
A. M. Spears.....Houston, Texas
Talmage V. Rogers.....Houston, Texas
J. A. Rickles.....Houston, Texas
W. T. Goss.....Houston, Texas
J. D. Larkin.....Houston, Texas

THE HOUSTON MEETING

RADIO PROGRAM

Tuesday, October 28

Station KRPC, Lamar Hotel
"Dental Health Education"
Fred A. Richmond...Kansas City, Kan.

Station KXYZ, Gulf Building
"Result of Neglect in Children"
Ralph L. Ireland.....Lincoln, Nebr.

Station KTRH, Rice Hotel
"Protective Dentistry for the Public"
Vern D. Irwin.....Minneapolis, Minn.

Wednesday, October 29

Station KPRC, Lamar Hotel
"Esthetics and Health in Dentistry"
F. W. Hinds.....Dallas, Texas

Station KXYZ, Gulf Building
"Control of Dental Diseases a Major Health Problem"
Leon R. Kramer.....Topeka, Kan.

Station KTRH, Rice Hotel
"Uncle Sam Has the Toothache"
Frank C. Cady.....Lexington, Ky.

Thursday, October 30

Station KPRC, Lamar Hotel
"The American Dental Association—Its Purpose and Function"
Lon W. Morrey.....Chicago, Ill.

Station KXYZ, Gulf Building
"Your New Teeth"
Robert R. Gillis.....Hammond, Ind.

Station KTRH, Rice Hotel
"The Importance of Complete Oral Examination"
L. M. FitzGerald.....Dubuque, Iowa

LUNCHEON CLUB PROGRAM

Tuesday, October 28, 12:15 p.m.

Joint meeting of Lions and Rotary Clubs of Pasadena, Texas, Methodist Education Building, Pasadena, Texas
John C. Brauer.....Iowa City, Iowa

Wednesday, October 29, 12:15 p.m.

Kiwanis Club of Houston, Rice Hotel
Walter T. McFall.....Asheville, N. C.

Lions Club of Houston, Texas State Hotel
J. Ben Robinson.....Baltimore, Md.

Thursday, October 30, 12:15 p.m.

Optimist Club of Houston, Rice Hotel
A. C. Wherry.....Salt Lake City, Utah

Rotary Club of Houston, Rice Hotel
W. H. Robinson.....Oakland, Calif.
Charles A. Sweet.....Oakland, Calif.
J. V. Gentilly.....Cleveland, Ohio
E. L. Ball.....Cincinnati, Ohio

SCHOOL PROGRAM

Tuesday, October 28

St. Thomas Academy, 4500 Memorial Drive, Houston, Texas
Charles F. Deatherage...Springfield, Ill.

Stephen F. Austin High School, Dumble & Jefferson Sts., Houston, Texas
Lloyd N. Harlow.....Jacksonville, Fla.

Reagan High School, 13th & Arlington Sts., Houston, Texas
R. C. Dalgleish....Salt Lake City, Utah

Wednesday, October 29

San Jacinto High School, Holman and Austin Sts., Houston, Texas
George W. Teuscher.....Chicago, Ill.

Milby High School, 1601 Broadway, Houston, Texas
R. F. Grider.....Louisville, Ky.

St. Agnes Academy, 3900 Fannin St., Houston, Texas
F. A. Bull.....Milwaukee, Wis.

Jefferson Davis High School, Quitman Ave., Houston, Texas
R. C. Leonard.....Baltimore, Md.

Thursday, October 30

Trinity Luthern Intermediate School, Reasoner and Washington Streets, Houston, Texas
Edward Taylor.....Austin, Texas

Sam Houston High School, 1300 Capitol Ave., Houston, Texas
J. R. Thompson.....Lincoln, Nebr.

Incarnate Word Academy, 609 Crawford St., Houston, Texas
A. O. Gruebbel.....Jefferson City, Mo.

Lamar High School, 3325 Westheimer St., Houston, Texas
Ruth Martin.....St. Louis, Mo.

WOMEN'S PROGRAM

Sunday, October 26

10:30 a.m. Rodeo, Huntsville, Texas. The train leaves the Union Station at 10:30 Sunday morning and returns to Houston by 7 o'clock Sunday evening.

Monday, October 27

The past presidents of the various state auxiliaries will be entertained by the Texas State Auxiliary. Inquire at the Ladies' Information Desk, Rice Hotel, for full particulars.

7:30 p.m. and 9:30 p.m. Vaudeville in the Music Hall of the Coliseum. Secure tickets on registration. There will be two shows, one at 7:30 and one at 9:30.

Tuesday, October 28

9:30 a.m. First General Session of the American Dental Association, Music Hall, Coliseum.

1:00 p.m. Luncheon and style show, Ball Room, Rice Hotel. Attendance limited to 600. Tickets $1.25 each.

8:00 p.m. Second General Session of the American Dental Association, Music Hall, Coliseum.

Wednesday, October 29

10:30 a.m. Texas Day: Busses will leave the Texas Avenue entrance of the Rice Hotel at 10:30 a.m. for the San Jacinto Inn. The inn is located at the San Jacinto battle grounds where Texas won its independence. The beautiful San Jacinto Memorial, the stone shaft of which rises to a height of 567 feet above the ground, stands on the San Jacinto battle grounds. Early registration is advisable as the number to make up the party is limited.

7:30 p.m. Dinner dance in honor of the President, Wilfred H. Robinson. Dinner and floor show in the ball room of the Rice Hotel. Reservations limited to 500. Tickets $2.50 each.

Thursday, October 30

8:15 p.m. Third General Session of the American Dental Association, Music Hall, Coliseum.

SCIENTIFIC AND HEALTH EXHIBITS

List of Exhibitors as of September 9, 1941

Dental Departments of State Boards of Health

Arkansas State Board of Health, Division of Dental Hygiene, Little Rock.

Illinois State Department of Health, Division of Dental Health Education, Springfield.

Missouri State Board of Health, Dental Division, Jefferson.

Texas State Department of Health, Dental Division, Austin.

Virginia State Board of Health, Dental Division, Richmond.

City Dental Programs

Houston Public School System, Houston, Texas.

Sam Houston School, Conroe, Texas.

Kern County Health Department, Bakersfield, Calif.

Memphis Department of Health, Memphis, Tenn.

Newark Board of Education, Newark, N. J.

Schools

Baylor University, College of Dentistry, Dallas, Texas.
F. W. Hinds, Dean.

Chicago College of Dental Surgery, Foundation for Dental Research, Chicago, Ill.
W. H. G. Logan, Dean.

Columbia University, College of Physicians and Surgeons, New York, N. Y.
Bion R. East and E. C. McBeath.

University of Michigan, School of Dentistry, Ann Arbor.
Ralph F. Sommer.

University of Minnesota, School of Dentistry, Minneapolis.
W. F. Lasby, Dean.

Northwestern University Dental School, Chicago, Ill.
J. R. Schumaker.

Ohio State University, College of Dentistry, Columbus.
W. D. Postle, Dean.

College of Physicians and Surgeons, School of Dentistry, San Francisco, Calif.
E. G. Sloman, Dean.

Texas Dental College, Houston.
F. C. Elliott, Dean.

University of Texas, Medical School, Galveston.

Washington University, School of Medicine, St. Louis, Mo.
V. P. Blair.
B. E. Lischer, L. R. Boling and E. E. Shepard, Markle Foundation.

Western Reserve University, School of Medicine, Cleveland, Ohio.
John Revesz and Milton Rabine, Hamann Museum.

Organizations

American Dental Association Bureau of Public Relations.

American Dental Association Committee on Economics.

American Dental Association Committee on Legislation.

American Dental Association Committee on Dental Preparedness.

American Dental Association Council on Dental Therapeutics and the Bureau of Chemistry.

American Dental Association Insurance Committee.

American Dental Association Relief Commission and Relief Fund Committee.

American Dental Association Research Commission and National Bureau of Standards.

American College of Surgeons.

American Dental Assistants Association.

American Dental Hygienists Association.

American Dietetic Association.

American Medical Association Council on Foods and Nutrition.

American Pharmaceutical Association and the Texas Pharmaceutical Association.

American Red Cross.

American Social Hygiene Association.

Chicago Association of Orthodontists.

Cleveland Museum of Health and Hygiene.

The Murry and Leonie Guggenheim Dental Clinic.

Hermann Hospital

International Association for Dental Research.

W. K. Kellogg Foundation.

Mayo Clinic.

Municipal Tuberculosis Sanitarium.

National Congress of Parents and Teachers.

Rochester Dental Dispensary.

Selective Service National Headquarters.

Texas State Dental Society Auxiliary.

U. S. Army Medical Museum.

U. S. Food and Drug Administration.

U. S. Department of Labor, Children's Bureau.

U. S. Public Health Service.

U. S. Leprosarium (U.S.P.H.S.)

Wisconsin State Dental Society (Eleanora Schuman).

Individual Exhibitors

Spencer R. Atkinson, Pasadena, Calif.

Paul J. Aufderheide, Cleveland, Ohio.

Clarence H. Blanchard, Los Angeles, Calif.

R. Blancoe, Buenos Aires, Argentine, S. A.

Jesse V. Boswell, M. D., Springfield, Mo.

Ralph Bowen, Houston, Texas.

James Barrett Brown, M.D., St. Louis, Mo.

J. C. Bryant, Oak Terrace, Minn.

George W. Christiansen, Detroit, Mich.

H. F. Curtis, Alexandria, Egypt.

Eduardo Ferraro, Santiago de Chile, S. A.

O. L. Geyer, Grey Eagle, Minn.

Conrad C. Gilkison, Cleveland, Ohio.

P. Philip Gross, Philadelphia, Pa.

Charles G. Grover, Denver, Colo.

T. A. Hardgrove, Fond du Lac, Wis.
Howard A. Hartman, Cleveland, Ohio.
Isadore Hirschfeld, New York, N. Y.
G. M. Hollenback, Los Angeles, Calif.
Louis H. Jorstad, M.D., and Bruce C. Martin, M.D., St. Louis, Mo.
V. H. Kazanjian, Boston, Mass.
Roland M. Klemme, M.D., St. Louis, Mo.
Joseph S. Landa, New York, N. Y.
Saul Levy, Scranton, Pa.
P. J. Murphey, Dallas, Texas.
T. E. Prosser, East St. Louis, Ill.
M. Sandel, Houston, Texas.
George A. Selleck, San Francisco, Calif.
A. P. Sweet, Rochester, N. Y.
Kirman E. Taylor, Denver, Colo.
E. A. Thomas, Hastings, Nebr.
Earl A. Thompson and Erle C. Thompson, International Falls, Minn.
Curt Von Wedel, M.D., Oklahoma City, Okla.
George R. Warner, Denver, Colo.
J. H. Williams and Virgil A. Kimmey, St. Louis, Mo.

VISUAL EDUCATION PROGRAM
(Motion Pictures)

Coliseum

Monday, October 27

10:00 a.m. to 12:00 m.

10:00 a.m. "Surgical Treatment of Periodontoclasia" (Technicolor)
Olin Kirkland.....Montgomery, Ala.

10:45 a.m. "Surgical Treatment of Periapical Infection and Canal Filling" (Technicolor)
Henry J. Droba.....Chicago, Ill.

11:00 a.m. "Precision Denture Technic" (Technicolor)
W. H. Terrell.....Glendale, Calif.

11:45 a.m. "Removal of Teeth and Surgical Preparation of Mouth for Immediate Denture" (Technicolor)
N. A. Lussier.....San Francisco, Calif.

Tuesday, October 28

10:00 a.m. to 12:00 m.

10:00 a.m. "Noses" (Technicolor)
James Barrett Brown, M.D.....
.....St. Louis,, Mo

10:15 a.m. "Jacket Crown Technic" (Technicolor)
Hugh Avary.....San Francisco, Calif.

10:45 a.m. "Partial Dentures—Unit Cast Partials" (Technicolor)
A. A. Nygard.....Dallas, Texas

11:05 a.m. "Tic Douloureux—Diagnosis and Treatment" (Technicolor)
J. R. Jaeger.....Denver, Colo.

11:45 a.m. "Cinefluorographic Study of Human Mastication Apparatus"
Meyer Klatsky.....New York, N. Y.

Thursday, October 30

2:00 to 4:00 p.m.

2:00 p.m. "Balanced Denture Service" (Technicolor)
Roland D. Fisher.....Glendale, Calif.

2:30 p.m. "Anterior Restorations" (Technicolor)
Earl J. Poe.....St. Louis, Mo.

3:00 p.m. "Diagnosis of Soft Tissue Lesions of Oral Cavity" (Technicolor)
Hermann Becks....San Francisco, Calif.

Friday, October 31

10:00 a.m. to 4:00 p.m.

10:00 a.m. "Denture Service" (Technicolor)
Visual Educational Service, University of Minnesota, Minneapolis

10:40 a.m. "Classification and Technic for Removal of Impacted Teeth" (Technicolor)
Glenn J. Pell
G. Thaddus Gregory..Indianapolis, Ind.

11:00 a.m. "Brown Stain Case" (Technicolor)
F. W. Hinds.....Dallas, Texas

2:00 p.m. "Porcelains, Acrylics, Electroformed Dies" (Technicolor)
C. O. McBean.....Los Angeles, Calif.

3:15 p.m. "Oral Surgery" (Technicolor)
V. H. Kazanjian.....Boston, Mass.

ANNOUNCEMENTS

AMERICAN DENTAL ASSOCIATION COMMITTEE ON LEGISLATION

The Committee on Legislation of the American Dental Association will meet in Room 320 of the Rice Hotel, Houston, Texas, October 26, at 9 a.m.

AMERICAN DENTAL ASSOCIATION PAST PRESIDENTS' LUNCHEON

Luncheon for the Past Presidents of the American Dental Association will be held in the Lacquer Room of the Rice Hotel, October 29, at 12 noon. Marcus L. Ward will preside and R. H. Volland will give the annual address.

COMMITTEE ON DENTAL PREPAREDNESS LUNCHEON

The Committee on Dental Preparedness will meet for lunch at 12 o'clock noon, October 29, in the South American Room, Rice Hotel. The meeting is open to the members of the A.D.A. Speakers: Lieut. Col. Carlton S. Dargusch, deputy director, Selective Service System: "The Administration of the Selective

Service Law"; Capt. Albert Knox, (DC), USN., chief of Dental Division, Bureau of Medicine and Surgery, United States Navy; Brig. Gen. Leigh C. Fairbank (DC), United States Army, and Lieut. Com. C. Raymond Wells (DC), USNR, chief dental officer of the Selective Service System.

PAN AMERICAN LUNCHEON

A luncheon will be given to the Pan American visitors, October 28, at 12 noon in South American Rooms A and I, Rice Hotel.

AMERICAN DENTAL ASSOCIATION COMMITTEE ON ECONOMICS

The Committee on Economics of the American Dental Association will meet in Room 336 of the Rice Hotel, Houston, Texas, October 26.

A.D.A. COMMITTEE ON PUBLIC HEALTH AND EDUCATION

The Committee on Public Health and Education of the American Dental Association will meet at 9:00 a.m., October 29 in Room 320, Rice Hotel, Houston, Texas.

MEMBERSHIP COMMITTEE OF THE A.D.A.

The Membership Committee of the American Dental Association will hold a breakfast meeting, October 27, at 8 a.m., in the Hunt Room, Rice Hotel, Houston, Texas.

AMERICAN DENTAL ASSOCIATION STATE SECRETARIES CONFERENCE

The American Dental Association State Secretaries Conference will be held in the French Room of the Rice Hotel, October 26, at 8:00 a.m.

AMERICAN DENTAL ASSOCIATION COUNCIL ON DENTAL EDUCATION

The Council on Dental Education will hold a meeting on October 24, in the Hunt Room of the Rice Hotel, Houston, Texas, at 9:00 a.m.

AMERICAN DENTAL ASSOCIATION RELIEF FUND COMMITTEE

The A.D.A. Relief Fund Committee will meet for a committee breakfast in the French Room of the Rice Hotel, Houston, October 28, at 8:00 o'clock.

E. E. GRAHAM, *Secretary.*

DENTAL PREPAREDNESS COMMITTEE

The Dental Preparedness Committee of the American Dental Association will hold a luncheon in the South American Room of the Rice Hotel, October 29, at 12:00 noon.

HOUSE OF DELEGATES LUNCHEON

The House of Delegates Luncheon will be held October 27 in the Ball Room of the Rice Hotel, Houston, Texas at 12:00 noon. The Texas State Dental Society will be the host.

ASSOCIATED GROUPS

AMERICAN ACADEMY OF RESTORATIVE DENTISTRY

The American Academy of Restorative Dentistry will hold its annual meeting at the Rice Hotel, Houston, Texas, October 25-26,

W. S. TUCKER, *Secretary,*
Canal Bank Building,
New Orleans, La.

AMERICAN ASSOCIATION OF DENTAL EDITORS

The American Association of Dental Editors will hold its annual meeting in the Rice Hotel, Houston, Texas, October 25. Meeting in Reception Room, 9:00 a.m. to 6:00 p.m.; luncheon, Pine Room, 12:00 m.; dinner, Reception Room, 6:30 p.m.

O. W. BRANDHORST, *Secretary,*
4952 Maryland Ave.,
St. Louis, Mo.

AMERICAN SOCIETY OF ORAL SURGEONS AND EXODONTISTS

The American Society of Oral Surgeons and Exodontists will meet in the Texas State Hotel, Houston, Texas, October 24-25.

HARRY BEAR, *Secretary,*
Professional Building,
Richmond, Va.

AMERICAN SOCIETY OF DENTISTRY FOR CHILDREN

The American Society of Dentistry for Children will meet in the Lamar Hotel, Houston, Texas, October 26-28.

RALPH IRWIN, JR., *Secretary,*
Corbett Building,
Portland, Ore.

AMERICAN FULL DENTURE SOCIETY

The American Full Denture Society will hold its thirteenth annual meeting in the Warwick Hotel, Houston, Texas, October 24-26.

H. L. HARRIS, *Secretary,*
216th C.A. (A.A.),
Camp Haan, Calif.

AMERICAN ASSOCIATION OF WOMEN DENTISTS

The American Association of Women Den-

tists will hold its twentieth annual meeting in the Rice Hotel, Houston, Texas, October 27.

MURIEL ROBINSON, *Secretary*,
4906 Walnut St.,
Philadelphia, Pa.

AMERICAN ASSOCIATION OF PUBLIC HEALTH DENTISTS

The American Association of Public Health Dentists will hold its annual meeting in the Lamar Hotel, Houston, Texas, October 26-28.

FRANK C. CADY, *Secretary*,
U.S.P.H.S. Hospital,
Lexington, Ky.

AMERICAN ACADEMY OF PLASTIC RESEARCH IN DENTISTRY

The American Academy of Plastic Research in Dentistry will meet in the Chamber of Commerce Auditorium, Houston, Texas, October 26.

LAMAR W. HARRIS, *Secretary*,
55 East Washington St.,
Chicago, Ill.

AMERICAN COLLEGE OF DENTISTS

The American College of Dentists will meet in the Rice Hotel, Ball Room, Houston, Texas, on October 26.

O. W. BRANDHORST, *Secretary*,
4952 Maryland Ave.,
St. Louis, Mo.

INTERNATIONAL COLLEGE OF DENTISTS

The International College of Dentists will meet in the Rice Hotel, Houston, Texas, October 26. Breakfast (regents only), Pine Room, 8:00 a.m.; banquet, South American Rooms A and I.

ELMER S. BEST, *Secretary*,
Medical Arts Building,
Minneapolis, Minn.

AMERICAN DENTAL ASSISTANTS ASSOCIATION

The American Dental Assistants Association will hold its seventeenth annual meeting in the Texas State Hotel, Houston, Texas, October 27-31. Luncheon, Ball Room, Rice Hotel, October 29, 12:00 m.

AILEEN M. FERGUSON, *Secretary*,
709 Centre Street,
Jamaica Plain, Mass.

AMERICAN DENTAL HYGIENISTS' ASSOCIATION

The American Dental Hygienists' Association will hold its annual meeting at the Lamar Hotel, Houston, Texas, October 27-31.

A. REBEKAH FISK, *Secretary*,
General Dispensary, U.S.A.,
Washington, D. C.

AMERICAN ACADEMY OF PERIODONTOLOGY

The American Academy of Periodontology will hold its twenty-eighth annual meeting October 23, 24, and 25 at the Lamar Hotel, Houston, Texas.

RAYMOND E. JOHNSON, *Secretary*,
Lowry Building,
St. Paul, Minn.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS

The fifty-ninth annual meeting of the National Association of Dental Examiners will be held in the San Houston Room, Rice Hotel, Houston, Texas, October 25-26. October 25, a luncheon will be given in the French Room on the mezzanine floor of the Rice Hotel, at which a round table discussion will be held on several topics relating to dentistry.

R. P. THOMAS, *Secretary*,
Francis Building,
Louisville, Ky.

NATIONAL SOCIETY OF DENTURE PROSTHESIS

The National Society of Denture Prosthesis will meet in the Warwick Hotel, Houston, Texas, October 20-25.

O. M. DRESEN, *Secretary*,
735 N. Water St.,
Milwaukee, Wis.

PIERRE FAUCHARD ACADEMY

The Pierre Fauchard Academy will meet in the Hunt Room, Rice Hotel, Houston, Texas, October 27, at 4:00 p.m.

CHICAGO COLLEGE OF DENTAL SURGERY

The Chicago College of Dental Surgery will give a breakfast in the South American Room A, Rice Hotel, Houston, Texas, at 8:00 a.m., October 29.

BAYLOR UNIVERSITY DENTAL SCHOOL

The Baylor University Dental School Luncheon will be given in the Sam Houston Room, Rice Hotel, Houston, Texas, October 29.

METROPOLITAN DENTAL SOCIETY

The Metropolitan Dental Society Officers' meeting will be held in the French room of the Rice Hotel, Houston, Texas, at 9:00 a.m., October 29.

UNITED STATES MILITARY SURGEONS

The U. S. Military Surgeons, Dental Di-

vision, will hold the annual meeting at the Rice Hotel, Houston, Texas, October 28, with dinner in the Ball Room at 6:30 p.m.

AMERICAN BOARD OF DENTAL SPECIALTIES

The American Board of Dental Specialties will meet in Room 336 of the Rice Hotel, Houston, Texas, October 21.

NEW YORK STATE DELEGATES BREAKFAST

Delegates of the Dental Society of the State of New York will hold their annual breakfast October 29, at 8:00 a.m., in the Sam Houston Room of the Rice Hotel, Houston, Texas.

AMERICAN DENTAL FOUNDATION, INC.

The American Dental Foundation, Inc. will hold a meeting October 29, at 8:30 a.m., in Room 336 of the Rice Hotel, Houston, Texas.

FORSYTH DENTAL INFIRMARY ALUMNI

The Forsyth Dental Infirmary Alumni will hold the annual dinner in the Lacquer Room of the Rice Hotel, Houston, Texas, October 28, at 6:30 p.m.

ACADEMY OF DENTURE PROSTHETICS

The Academy of Denture Prosthetics will meet in the Houston Dental College October 20.

I. LESTER FURNAS, *Secretary*,
928 Silverado St.,
La Jolla, Calif.

AMERICAN DENTAL PUBLIC HEALTH INSTITUTE FOR TEACHERS

The American Dental Public Health Institute for Teachers will be held in the San Jacinto High School, Holman and Austin streets, October 28, at 3:00 p.m. Speakers: Frank C. Cady, Lexington, Ky.; D. B. Harmon, Austin, Texas, and Konrad Lux, Waco, Texas.

AMERICAN DENTAL GOLF ASSOCIATION

Among the golf clubs at which the members of the American Dental Golf Association will be privileged to play in their annual tournament in Houston, Texas, in October, will be three of the most beautiful golf courses in the South: Houston Country Club, for Class A; River Oaks Country Club, for Class B, and Brae-Burn Country Club, for Class C.

The dinner preceding the Calcutta Pool Sweepstakes will be held October 26, at 7:00 p.m., in the fourth floor Ball Room of the Lamar Hotel.

A. A. ARNOLD, *Local Secretary*,
1021 Esperson Bldg.,
Houston, Texas.

AMERICAN DENTAL TRAP SHOOTERS LEAGUE

The Trapshooters League of the American Dental Association will hold its yearly shoot at Houston, Texas, October 27. The shoot will be staged at the Houston Gun Club at 9:00 a.m., so that competitors may complete their trapshooting before the golf tournament, at 1 p.m.

The program will consist of fifty 16-yard single birds, to be followed by fifty handicap birds; which will be based on the first fifty single 16-yard birds. Prizes will be given in all yardages, so that men shooting in the lower brackets may win. The shooters will be classified according to their scores made on the first fifty birds. A handicap committee will be on the grounds for this purpose.

SKEET SHOOT: There will be the usual 100 yard Target Skeet Shoot held at the Houston Skeet Club on Monday, October 27, at 9:00 a.m.

The committee will appreciate a card from those men who are coming. Entrance fee, $2.

DAVID HAGERMAN, *Local Secretary*,
312 Second National Bank Bldg.,
Houston, Texas.

NEW ORLEANS DENTAL ASSOCIATION OPEN HOUSE

The New Orleans Dental Association will hold open house for members of the American Dental Association and their families going to Houston. Headquarters, Roosevelt Hotel, October 24-26.

NORMAN F. GUENO, *President*.

FRATERNITIES

DELTA SIGMA DELTA FRATERNITY

The Delta Sigma Delta Fraternity will hold its annual banquet in the Rice Hotel Ball Room, Houston, Texas, October 27, at 6:30 p.m. Headquarters: Texas State Hotel.

XI PSI PHI FRATERNITY

The annual reunion and banquet of Xi Psi Phi Fraternity will be held in the South

American room of the Rice Hotel, Houston, Texas, October 27. Fraternity headquarters will be maintained, October 26 to 30, in Houston at the Ben Milam Hotel. The Houston Alumni Chapter will conduct a formal initiation at 3 p.m., October 27, in the Ben Milam Hotel.

RALPH H. AIKEN,
Supreme President,
601 First National Bank Bldg.,
Atlanta, Ga.

PSI OMEGA FRATERNITY

The Psi Omega Fraternity will have headquarters at the Lamar Hotel, Houston, Texas, October 27, and all activities, including the banquet, will take place there.

OMICRON KAPPA UPSILON SOCIETY

The Omicron Kappa Upsilon Fraternity will hold its annual luncheon in the Sam Houston Room, Rice Hotel, Houston, Texas, October 27, at 12:00 noon.

JOINT PROGRAM OF AMERICAN ASSOCIATION OF PUBLIC HEALTH DENTISTS AND AMERICAN SOCIETY OF DENTISTRY FOR CHILDREN

MONDAY AFTERNOON, OCTOBER 27, 1941
LAMAR HOTEL, HOUSTON, TEXAS

Greetings: R. C. Dalgleish, president, American Association of Public Health Dentists, and Response: Frank L. Lamons, president, American Society of Dentistry for Children.

Symposium: Coordinated Health Activities in a Dental Program for the Preschool Child.

"Organization and Planning of Preschool Dental Program."
Emory W. Morris.
Discussion by Walter J. Pelton.

"Actual Contact with Child and Parent."
David B. Ast.
Discussion by Allen O. Gruebbel.

"Follow-Up After Contact."
Charles F. Deatherage.
Discussion by P. E. Blackerby, Jr.

"Pediatrics and Pedodontics."
J. M. Coleman, M.D.
Discussion by F. C. Cady.

"Care of the Preschool Child by the Endowed Clinics."
John Oppie McCall.
Discussion by John C. Brauer.

"Care of the Preschool Child by the Private Practitioner."
Charles A. Sweet.
Discussion by Kenneth A. Easlick.

"Orthodontic Care of the Preschool Child."
Claude Wood.
Discussion by Walter T. McFall.

Preview of new dental film "About Faces." Produced by Cator Woolford, Sterling, Ga., and George Williams, Atlanta, Ga.

RALPH L. IRELAND, *Chairman,*
Liaison Committee,
American Society of Dentistry
for Children.

LEON R. KRAMER, *Chairman,*
Liaison Committee,
American Association of
Public Health Dentists.

TECHNICAL EXHIBITS

Abbott Laboratories, North Chicago, Ill.
Ackerman Dental Mfg. Co., Santa Monica, Calif.
Acralite Company, Inc., New York, N. Y.
Aderer, Inc., Julius, New York, N. Y.
American Cabinet Co., Two Rivers, Wis.
Antidolor Mfg. Co., Inc., New York, N. Y.
Austenal Laboratories, Inc., Chicago, Ill.

Baker & Co., Inc., Newark, N. J.
Bell-Art Mfg. Co., McKinney, Texas.
Bell Dental Products Co., New York, N. Y.
Bendick Co., Lapeer, Mich.
Boos Dental Laboratories, Henry P., Minneapolis, Minn.
Bosworth Co., Harry J., Chicago, Ill.
Buffalo Dental Mfg. Co., Buffalo, N. Y.
Burton Mfg. Co., Chicago, Ill.
Butler Co., John O., Chicago, Ill.

Carnation Milk Sales Co., Oconomowoc, Wis.
Cary Co., A. P., Houston, Texas.
Castle Co., Wilmot, Rochester, N. Y.
Caulk Co., L. D., Milford, Del.
Chicago X-Ray Film & Mount Co., Chicago, Ill.
Church & Dwight Co., Inc., New York, N. Y.
Cleveland Dental Mfg. Co., Cleveland, Ohio.
Columbia Dentoform Corp., New York, N. Y.
Columbus Dental Mfg. Co., Columbus, Ohio.
Cook Laboratories, Inc., New York, N. Y.
Corega Chemical Co., Inc., Cleveland, Ohio.
Cosmos Dental Products, Inc., New York, N. Y.
Crescent Dental Mfg. Co., Chicago, Ill.

Dee & Co., Thomas J., Chicago, Ill.
Dental Perfection Co., Los Angeles, Calif.
Dentists' Supply Co. of New York, New York, N. Y.
Dudley Research Corp., New York, N. Y.

Eastman Kodak Co., Rochester, N. Y.

Fischer & Co., Inc., H. G., Chicago, Ill.

General Electric X-Ray Corp., Chicago, Ill.
Goldsmith Bros. Smelting & Refining Co., Chicago, Ill.

Hanau Engineering Co., Inc., Buffalo, N. Y.
Hu-Friedy Mfg. Co., Chicago, Ill.

Ideal Tooth Incorporated, Cambridge, Mass.

Jelenko & Co. Inc., J. F., New York, N. Y.
Johnson & Johnson, New Brunswick, N. J.
Justi & Son, Inc., H. D., Philadelphia, Pa.

Kerr Dental Mfg. Co., Detroit, Mich.
Kolynos Co., Jersey City, N. J.
Konformax Laboratories, Brooklyn, N. Y.
Kromel Laboratories, New York, N. Y.

Lactona Incorporated, St. Paul, Minn.
Lea and Febiger, Philadelphia, Pa.
Lippincott Co., J. B., Philadelphia, Pa.
Luxene, Inc., New York, N. Y.

McCaskey Register Co., Alliance, Ohio
McKesson Appliance Co., Toledo, Ohio.
Medical Protective Co., Fort Wayne, Ind.
Merck & Co. Inc., New York, N. Y.
Minimax Co., Chicago, Ill.
Mizzy, Inc., New York, N. Y.
Mosby Co., C. V., St. Louis, Mo.
Moyer Co., Inc., J. Bird, Philadelphia, Pa.

Ney Co., J. M., Hartford, Conn.
Novocol Chemical Mfg. Co., Inc., Brooklyn, N. Y.

Ohio Chemical & Mfg. Co., Cleveland, Ohio.

Pelton & Crane Co., Detroit, Mich.
Pendleton & Arto Co., Houston, Texas.
Philip Morris & Co., Ltd., Inc., New York, N. Y.
Picker X-Ray Corp., Cleveland, Ohio
Precious Metals Research Works, Inc., New York, N. Y.
Premier Dental Products, Philadelphia, Pa.
Proco-Sol Chemical Co., Inc., Philadelphia, Pa.
Pycopé, Inc., Jersey City, N. J.

Ransom & Randolph Co., Toledo, Ohio.
Ritter Dental Mfg. Co., Inc., Rochester, N. Y.
Rocky Mountain Metal Products Co., Denver, Colo.

Saunders Co., W. B., Philadelphia, Pa.
Schaefer, Oskar, Jersey City, N. J.
Spyco Smelting & Refining Co., Minneapolis, Minn.
Squibb & Sons, E. R., New York, N. Y.
Star Dental Mfg. Co., Philadelphia, Pa.

Ticonium, Albany, N. Y.

Union Broach Co., Inc., New York, N. Y.
Universal Dental Co., Philadelphia, Pa.

Vernon-Benshoff Co., Pittsburgh, Pa.

Weber Dental Mfg. Co., Canton, Ohio.
Wernet Dental Mfg. Co., Jersey City, N. J.
Whip-Mix Corp., Louisville, Ky.
White Dental Mfg. Co., S. S., Philadelphia, Pa.
White Laboratories, Inc., Newark, N. J.
Williams Gold Refining Co., Buffalo, N. Y.

PROCLAMATION

BY THE

Governor of the State of Texas

TO ALL TO WHOM THESE PRESENTS SHALL COME:

WHEREAS, the important subject of Dental Health is a topic that should be given more consideration by every man, woman and child in Texas and elsewhere, as it substantially affects their welfare and aids in the development of sound oral hygiene; and

WHEREAS, it is the distinct privilege of the Lone Star State to act as host to the American Dental Association assembled in convention at Houston; and

WHEREAS, this worthy organization since its creation in 1859 has sponsored the promotion of dental science and has assisted immeasurably in the advancement of that profession and the alleviation of human pain; and

WHEREAS, all phases of this vocation will be discussed by the members of the convention, and by virtue of the advantages gained by this type of comparative research, the people of Texas and of the Nation will be materially benefited thereby:

NOW, THEREFORE, I, Coke Stevenson, Governor of the State of Texas, do hereby set aside and proclaim the week of October 27 - November 3, 1941, as

DENTAL HEALTH WEEK

and urge that it be fittingly observed in our State of Texas.

IN TESTIMONY WHEREOF, I have hereunto signed my name and caused the Seal of State to be affixed hereon, at Austin, this the 2nd day of September, A. D., 1941.

Coke R. Stevenson
GOVERNOR OF TEXAS

BY THE GOVERNOR:

Wm. J. Lawson
SECRETARY OF STATE

C. A. PICKETT
MAYOR

CITY OF HOUSTON
TEXAS

PROCLAMATION

BY THE

MAYOR OF THE CITY OF HOUSTON

It is indeed a privilege for Houston to be the host to the American Dental Association on the occasion of its annual convention which will be held in our City.

This great organization, since its inception in 1859, has actively sponsored the promotion of dental science and has made an outstanding contribution to the advancement of the profession which has resulted in many benefits to mankind.

The importance of dental health is something that should be given full consideration by every individual, inasmuch as it substantially affects the welfare of the people and immeasurably aids in the development of sound health.

Various phases of this vocation will be discussed by the delegates at the convention and by reason of the many advances that are gained by this type of comparative research, the people of Houston, and of Texas, and of the nation will be materially benefited thereby.

The City of Houston is well aware of the great benefits that are derived from the services of dental science because of the fine profession of dentistry in Houston, and because of The Texas Dental College which occupies a foremost place among our institutions of higher learning.

NOW, THEREFORE, I, C. A. Pickett, Mayor of the City of Houston, do hereby proclaim the week of October twenty-six to November first, 1941, as Dental Health Week and urge that it be fittingly and appropriately observed by the citizens of Houston.

C. A. Pickett

Mayor of the City of Houston

HOUSTON 1941

HUNTSVILLE RODEO

THE PRECONVENTION ENTERTAINMENT FEATURE

A RARE opportunity to enjoy the thrills of an honest-to-goodness wild and woolly Rodeo is provided by the convention entertainment committee at the American Dental Association's Eighty-Third Annual Meeting in Houston, October 27-31.

The Huntsville Prison Rodeo, presented annually, has come to be known as the biggest and best of all rodeos, and fans travel from all parts of America to witness it.

A block of 500 seats has been reserved for Sunday, October 26, for American Dental Association members and guests, who will make the 40-mile trip to Huntsville on a special, air-conditioned train, with the entire cost $2.

Among the 175 performers in the Huntsville Rodeo are some of the most skilful and certainly the most daring of the cattle country's broncho busters and bulldoggers.

The Huntsville Rodeo is not a commercial entertainment. The nominal admission charge helps maintain the prison's education and recreation fund.

Be sure not to miss the greatest entertainment the Southwest can offer. Make your reservations now, addressing W. T. Newton, chairman, American Dental Association Entertainment Committee, 344 Rice Hotel, Houston, Texas.

"Ride 'im, Cowboy!"

American Dental Association

Houston, Texas October 27-31, 1941

HOTEL RESERVATIONS

To secure hotel accommodations for the 1941 Meeting, consult the rate list on the next page and fill out the blank below. Mail this immediately to the hotel of your first choice or to the Housing Committee, Room 344, Rice Hotel, Houston, Texas. Confirmation will be sent to you by the hotel.

Second and third choices of hotel should be indicated. If the reservation cannot be made at any of the hotels of your choice, the Housing Committee will place you in as favorable a hotel as possible and will notify you.

Please remember that a reservation constitutes a contract with the hotel to provide you with the accommodations you desire. If you find it impossible to carry out your part of the contract, namely, to occupy the room at the time agreed upon, please write or wire the hotel releasing the room, in order that it may be available for other members.

RAILROAD RATES TO HOUSTON

The railroads do not offer any special reduced rates to Houston for those attending the American Dental Association meeting. They do, however, offer winter rates to Houston from almost every city of the country, which are less than the regular railroad fares.

We suggest that local railroad agents be consulted for information.

HARRY B. PINNEY, *Secretary,*
American Dental Association.

APPLICATION FOR HOTEL ACCOMMODATIONS

AMERICAN DENTAL ASSOCIATION

Houston, Texas October 27-31, 1941

HOTEL.....1st choice

HOTEL.....2nd choice

HOTEL.....3rd choice

Kindly reserve the following: ☐ Single room ☐ Double room ☐ Twin beds.

.....rooms with bath for.....persons $.....per room

.....rooms without bath for.....persons $.....per room

Arriving on October.....at.....a.m.....p.m.

ROOMS TO BE OCCUPIED BY:

NAME	ADDRESS IN FULL

NOTE TO HOTEL NAMED AS FIRST CHOICE: If the hotel of first choice is unable to make the reservation requested, this application should be forwarded at once to the Housing Committee, Room 344, Rice Hotel, Houston, Texas.

SCHEDULE OF RATES

ALL ROOMS WITH BATH*

Hotels	Single	Double	Twin	Suites
AUDITORIUM, 701 Texas	$2.50–3–3.50	$3.50–4.50–5.50	$5	
BELMONT, 1308 Clay	$2	$3–3.50		
BRAZOS, 608 Preston	$2.50	$4	$4	
BRISTOL, 712 Travis	$2.50–3–3.50	$3.50–4–5	$4	
COTTON, Rusk and Fannin	$2–2.50–3	$3–3.50–4.50	$4	
DE GEORGE, 1418 Preston	$2	$3–3.50	$4.50–5.50	
FREDS HOTEL, 1006 Dallas	$1.50–2	$2–3	$2.50	
SAM HOUSTON, 1115 Prairie	$2.50–3–3.50	$4–5–6	$5–6	
HAMFORD APARTMENT, 919 Dallas	$1.50–2	$2–2.50		
HOUSTON CLUB, Commerce Building	$4–5–6	$6–7–8		
LAMAR, Main and Lamar	$3–4–5–6	$5–6–8–9	$5–7–8–9	$12–14–15–18–20–24
LAMAR ANNEX HOTEL, 916 McKinney	$2.50–3–4	$4–4.50–5–6	$5–6	
LEE, 1114 Polk	$2	$2.50–3	$3	
MACATEE, 519 Washington	$2–3–3.50	$3–4–5	$4–5	
BEN MILAM, 1521 Texas	$2.50–3–3.50	$3.50–4–4.50	$6	
MILBY, 902 Texas	$2–2.50–3	$3–3.50–4	$4–4.50–5	
OXFORD, 811 Lamar	$2	$3–4		
PARK, 610 Louisiana	$1.50	$2–2.50	$3	
WILLIAM PENN, 1423 Texas	$2–2.50–3–4	$3–3.50–4.50–5–5.50	$6	
PLAZA, 5020 Montrose	$3–3.50–4–5	$4.50–5–6–7	$6–7	$8–15
RHODES APARTMENT, 611 LaBranch	$2	$2.50–3		
RICE (Headquarters), Main and Texas	$3–4–4.50–5	$5–6–6.50–7–8	$6–7–8–9	$12–22–40
ROOSEVELT, 1111 Clay	$2	$2.50–3		
ROSSONIAN APARTMENT, 919 Fannin				$6–8
SAN JACINTO, 820 Main	$2.50–3–3.50–4	$4–4.50–5–5.50	$5.50–6–7–8	$10
STRATFORD, 414 Fannin	$2–2.50–3	$4.50–4–4.50	$4–4.50	
TENNISON, 801 Washington	$2	$3	$3.50	
TEXAS STATE, 720 Fannin	$3–4–5–6	$5–6–7–8	$6–7–8–9–10	$12–16–18–24
TRAVELERS, 114 Main	$1.50–2	$2–3		
WALEE, 1010 Caroline	$2	$2.50–3		
WARWICK, 5701 Main	$3.50–5	$3.50–5	$5–6	$6.50–7.50–9–11–18
WOODROW, 1412 Fannin	$2–2.50	$3–4–5		

*Rates on rooms without bath by request.

MEMBERS OF THE HOUSE OF DELEGATES 1941

DELEGATES AND ALTERNATES

ALABAMA

Delegates
Allen, Hunter S., Comer Building, Birmingham
Dillon, L. B., Woodward Building, Birmingham
Matthews, George W., Protective Life Building, Birmingham

Alternates
Blue, J. A., Merchants Bank Building, Mobile
McGavock, R. J., Woodward Building, Birmingham
McKinnon, H. T., Jr., Troy

ARIZONA

Delegate
Bennett, Paul H., Consolidated Bank Building, Tucson

Alternate
Saxman, Melvin V., Professional Building, Phoenix

ARKANSAS

Delegates
Dietrich, F. W., Camden
Sternberg, I. M., Merchants Nat'l Bank Building, Fort Smith

Alternates
Woods, Fred D., Donaghey Building, Little Rock
Hudson, A. W., Prescott

SOUTHERN CALIFORNIA

Delegates
Casto, F. M., 801 Silverado, La Jolla
Taylor, John E., 6777 Hollywood Blvd., Hollywood
Neblett, W. S., 3705 Main St., Riverside
Paul, C. E., Moore Building, Santa Ana
Furnas, I. Lester, 928 Silverado, La Jolla
Kaiser, Frank S., 415 N. Camden Drive, Beverly Hills
Hartley, Ralph R., Pellissier Building, Los Angeles
Reagan, C. A., 1930 Wilshire Blvd., Los Angeles
Van Buskirk, Guy, 1930 Wilshire Blvd., Los Angeles
Thompson, Walter S., 727 W. 7th St., Los Angeles
Vieille, Albert C., Roosevelt Building, Los Angeles

Alternates
Pierce, J. Madison, 4401 Melrose Ave., Los Angeles
Goodman, Nye W., Story Building, Los Angeles
Marcus, David, 648 S. Bonnie Brae, Los Angeles
Lyman, E. E., First Trust Building, Pasadena
Webber, Chester H., Bank of America Building, San Diego
Zemke, John W., 1017 N. Pacific St., Glendale
Buckley, J. P., 7056 Los Tilos Road, Hollywood
Murphy, Don H., 2122 Atlantic Ave., Long Beach
Lincoln, Charles W., 65 N. Madison Ave., Pasadena
Ariaudo, Arnold A., Professional Building, El Centro
Jepson, John M., Taft Building, Hollywood
Henahan, J. P., 6381 Hollywood Blvd., Hollywood
Lumsden, Robert M., 1680 N. Vine St., Hollywood
Garnhart, Warren C., 1033 Gayley Ave., W., Los Angeles
Brownson, E. R., 3875 Wilshire Blvd., Los Angeles
McCollum, B. B., Professional Building, Los Angeles
Duzik, John L., 409 W. Camden Drive, Beverly Hills

CALIFORNIA STATE

Delegates
Gurley, John E., 350 Post St., San Francisco
Sloman, Ernest G., 344 14th St., San Francisco
Fleming, Willard C., 1906 Franklin St., Oakland
Gill, J. Raymond, 450 Sutter St., San Francisco
Gray, Charles F., Medico-Dental Building, Sacramento
Graham, James Allen, 209 Post St., San Francisco
Ryder, William B., Jr., 2000 Van Ness Ave., San Francisco
Kingsbury, B. C., 490 Post St., San Francisco
Blake, Reuben L., 135 Stockton St., San Francisco
Aubertine, Don J., Flood Building, San Francisco

Alternates
Becks, Hermann, U. C. Hooper Foundation, San Francisco
Sweet, Charles A., 2940 Summit St., Oakland
Moose, Sanford M., 450 Sutter St., San Francisco
Bishop, Lyall O., Bank of America Building, Berkeley
Butler, Clarence O., 3115 Webster St., Oakland
Beechen, I. Irwin, 2940 Summit St., Oakland

COLORADO

Delegates
Brown, Charles F., Mack Building, Denver
Johnston, Lloyd W., Republic Building, Denver

Alternates
Brown, Charles J., McNeen Block, La Junta
Flint, William H., 576 Broadway, Littleton

CONNECTICUT

Delegates
Hicks, Henry, 5 Glen Court, Greenwich
Allen, B. H., 647 Main St., Hartford
Peterson, C. E., 9 Elm St., Rockville
Gibb, Hugh, Jr., 107 Whitney Ave., New Haven
Brooks, C. G., 302 State St., New London
Arnold, E. S., 37 Linnard Road, West Hartford

Alternates
Murren, John P., Medical Building, Bridgeport
Fitch, A. W., 140 State St., New London
Vivian, C. W., 58 Elbridge Road, New Britain
Richmond, E. H., Windsor Locks
Loftus, J. L., Colony Building, Hartford
Morgan, R. E., Bishop Building, Norwalk

DELAWARE

Delegate
Traynor, Philip A., 807 Washington St., Wilmington

Alternate
Nelson, Clyde, Milford

DISTRICT OF COLUMBIA

Delegates
Weakley, A. D., 1029 Vermont Ave., N. W., Washington
Ellis, George R., 1029 Vermont Ave., N. W., Washington
Newton, Howard J., 1149 16th St., N. W., Washington

Alternates
Fitzgibbon, David J., 1801 Eye St., N. W., Washington
Bernhard, J. Walter, 1835 Eye St., N. W., Washington
Brown, James W., 1726 Eye St., N. W., Washington

FLORIDA

Delegates
Lunsford, E. C., 2742 Biscayne Blvd., Miami
Harlow, L. N., State Board of Health, Jacksonville
Wood, W. P., Jr., 436 W. LaFayette St., Tampa
Thompson, E. L., Atlantic Block, Daytona Beach

Alternates
Shields, I. W., Huntington Building, Miami
Meyer, F. P., Hall Building, St. Petersburg
Renado, J. M., Huntington Building, Miami
Wells, R. F., Folkes Building, Panama City

GEORGIA

Delegates
Banks, W. H., Montezuma
Mason, R. Holmes, Macon
Mitchell, J. R., Candler Building, Atlanta

Alternates
Darby, L. H., Vidalia
Grant, T. A., 118 E. Jones St., Savannah
Weichselbaum, William, Savannah

HAWAII

IDAHO

Delegates
Brookfield, B. M., Idaho Falls
Barkdull, Stewart, Hopkins Building, Blackfoot

Alternates
Flack, P. G., Boise
Hoarty, W. J., Eastman Building, Boise

ILLINOIS

Delegates
Blayney, J. R., 950 E. 59th St., Chicago
Vedder, N. D., Carrollton
Jacob, L. H., Jefferson Building, Peoria
McNulty, R. W., 1757 W. Harrison St., Chicago
Arganbright, N. A., State Bank Building, Freeport
Cartwright, Glen E., 4000 W. North Ave., Chicago
Dodd, Lloyd H., Citizens Building, Decatur
Donelan, John J., United Mine Workers Building, Springfield
Farrell, Frank A., 757 W. 79th St., Chicago
Glawe, Arthur E., Safety Building, Rock Island
Hurlstone, Frank J., 30 N. Michigan Ave., Chicago
King, Warren L., Wells Building, Quincy
Kremer, Leo W., 55 E. Washington St., Chicago
Kurth, LeRoy E., 2750 W. North Ave., Chicago
Kurz, Charles S., Carlyle
Mahoney, James E., Wood River
McMillan, L. G., Temple Building, Danville
Mayer, William E., 636 Church St., Evanston
Oppice, Harold W., 1002 Wilson Ave., Chicago
Spickerman, A. C., DeKalb
Steele, J. A., Marengo
Welch, Harold W., 25 E. Washington St., Chicago
Zielinski, Joseph B., 3147 Logan Blvd., Chicago
Zinser, Melford E., 55 E. Washington St., Chicago

Alternates
Chamberlain, C. E., Jefferson Building, Peoria
Fitzpatrick, T. A., 143 N. Hale St., Wheaton
Gonwa, W. J., Chrisman
Guerrero, J. J., 3932 W. Jackson Blvd., Chicago
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Tedrow, B. H., Taylorville
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INDIANA

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Ewbank, E. E., Kingman
Longcamp, H. J., Gibson Building, Aurora
Crawford, William H., 1121 W. Michigan St., Indianapolis
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Carr, Guthrie P., Loan & Trust Building, Lafayette
Carr, J. B., Hume-Mansur Building, Indianapolis
Walters, W. S., 303½ State St., West Lafayette
Mason, Herbert W., 658 Fairfield Ave., Indianapolis

IOWA

Delegates
Foster, C. S., Dows Building, Cedar Rapids
Hildebrand, J. G., Blackhawk Building, Waterloo
Pool, Hardy F., Foresters Building, Mason City
Charters, W. J., Southern Surety Building, Des Moines
FitzGerald, L. M., Roshek Building, Dubuque
Bolks, H. G., Badgerow Building, Sioux City
Hemsworth, L. C., Black Building, Waterloo

Alternates
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Whinery, F. B., J. C. Bank Building, Iowa City
Altfillisch, H. J., Roshek Building, Dubuque
Lehman, C. V., 303 Second Ave., S. E., Cedar Rapids
Kromer, E. H., Waverly
Stewart, C. H., Farragut
Matteson, R. C., Frances Building, Sioux City

KANSAS

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Buff, A. J., Mills Building, Topeka
Kramer, Leon R., State Board of Health, Topeka
Robison, Homer B., Rorabaugh-Wiley Building, Hutchinson

Alternates
Hodge, E. L., McPherson
Bunker, H. L., Junction City
Richmond, John W., Huron Building, Kansas City
Morgan, John E., Emporia

KENTUCKY

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Thomas, R. P., Francis Building, Louisville
Wilson, O. D., Masonic Building, Owensboro
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Essig, J. L., Heyburn Building, Louisville
O'Rourke, J. T., 129 E. Broadway, Louisville

LOUISIANA

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Rozas, A., Eunice

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Tiblier, S. L., Canal Building, New Orleans
Fowler, Sanders, Jr., Slattery Building, Shreveport

MAINE

Delegates
Fitzgerald, Edward J., Boothbay Harbor
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Woods, Philip W., State Bureau of Health, Augusta

MARYLAND

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McCarthy, H. B., Medical Arts Building, Baltimore
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Cronin, Harold J., 739 Liberty St., Springfield

Lawrence, Glenn W., 412 Beacon St., Boston
Miner, Leroy M. S., 363 Marlborough St., Boston
Peters, Maurice E., 60 Charlesgate W., Boston
Rounds, Frank W., 403 Commonwealth Ave., Boston
Wallace, John R., 1 Mt. Vernon St., Winchester
Wesson, Robert S., 60 Charlesgate W., Boston
Williams, Austin T., 70 Washington St., Salem
Wright, Edgar A., 70 Washington St., Salem

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Soja, Richard A., 878 S. Main St., Fall River
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MINNESOTA

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Gyllenborg, L. C., Medical Arts Building, Minneapolis
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Gish, E. J., Le Center
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Webb, W. Lester, Fairmont

MISSISSIPPI

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Abbott, Rush P., West Point

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Marré, Leo F., University Club Building, St. Louis
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Taylor, J. A., Eldon
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Flannery, B. K., Poplar Bluff
Elzea, C. F., Columbia

MONTANA

Delegates
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Degman, H. S., Forsythe

Alternates
Nelson, R. H., Missoula
Rafish, S. M., Butte

NEBRASKA

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Hunt, L. T., Security Mutual Building, Lincoln
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Bruening, E. H., City National Bank Building, Omaha

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Whitcomb, F. F., Medical Arts Building, Omaha
Spencer, G. L., Sharp Building, Lincoln
Merchant, H. A., Medical Arts Building, Omaha

NEVADA

Delegate
Miller, O. F., Medico-Dental Building, Reno

Alternate
Comish, Stephen W., Henderson Bank Building, Elko

NEW HAMPSHIRE

Delegates
Jacobs, Leon H., Exeter
Putney, William H., Concord

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Godfrey, E. C., Dover
Frost, R. C., Manchester

NEW JERSEY

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Jennings, Edward J., 126 W. State St., Trenton
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Brach, Louis, 112 Monticello Ave., Jersey City
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Connell, Bertrand T., 26 Journal Square, Jersey City
Carr, John G., 414 Cooper St., Camden

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Lyons, Stephen M., 382 Springfield Ave., Summit
Giordano, James V., 425 Union Ave., Paterson
Newman, Eugene W., 16 Wallace St., Red Bank
White, E. R., 921 Bergen Ave., Jersey City
Burke, J. Frank, 921 Bergen Ave., Jersey City
Steigerwald, Clarence, S. Jackson and Atlantic Aves., Atlantic City
Reock, Ernest C., 367 Washington Ave., Belleville
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Schneider, Ernest J. H., 519 Prospect St., Maplewood
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NEW MEXICO

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Alternate
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NEW YORK

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Varley, Martin F., 543 Warren St., Hudson

NORTH CAROLINA

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McFall, Walter T., Flat Iron Building, Asheville
Minges, C. E., Rocky Mount
Jackson, Wilbert, Clinton

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Alford, F. O., First National Bank Building, Charlotte
Coble, L. G., Greensboro
Bobbitt, S. L., Raleigh
Poindexter, C. C., Jefferson Standard Building, Greensboro

NORTH DAKOTA

Delegates
Musberger, L. E., Jamestown
Sweet, C. F., Minot

Alternates
Gilbert, L. I., Fargo
Follett, W. C., Devils Lake

OHIO

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Ball, E. L., Doctors Building, Cincinnati
Bach, E. N., Professional Building, Toledo
Aufderheide, P. J., Rose Building, Cleveland
Way, T. I., Doctors Building, Cincinnati
Appleman, R. M., Walter Reid Hospital, Washington, D. C.
Gentilly, J. V., Rose Building, Cleveland
Jarvis, H. C., Mercantile Library Building, Cincinnati
Stephan, John F., Keith Building, Cleveland
Mills, E. C., 255 E. Broad St., Columbus
Young, O. M., Marion
Pryor, W. J., Rose Building, Cleveland
Schott, C. H., Neave Building, Cincinnati

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Mills, C. W., Chillicothe
Jones, W. I., 327 E. State St., Columbus
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Travis, J. W., 2679 Monroe St., Toledo
Cosgray, W. J., 1211 Edison Building, Toledo
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Cottrell, H. V., 79 E. State St., Columbus
Hurst, W. W., 2083 Adelbert Road, Cleveland
Sargeant, W. S., Nicholas Building, Toledo
McDermott, T. J., Rose Building, Cleveland

OKLAHOMA

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Flesher, W. E., Medical Arts Building, Oklahoma City
Boyer, O. W., Perry

Alternates
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Thompson, B. C., National Mutual Building, McAlester
Dunn, R. M., Medical Arts Building, Tulsa

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Bettman, M. M., Medical Arts Building, Portland

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Grissinger, E. D., Murphy Building, Bedford
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Ludwig, Ned H., 217 Oakland Ave., Pittsburgh
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PHILIPPINE ISLANDS

PUERTO RICO

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Alternates
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Durant, E. P., Sumter

Alternates
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Higgins, H. B., Spartanburg

SOUTH DAKOTA

Delegates
Elmen, Ernest W., Sioux Falls
Tarbell, H. G., Watertown

Alternates
Nelson, Charles L., Brookings
Donahoe, J. D., Sioux Falls

TENNESSEE

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Elam, Roy O., Medical Arts Building, Nashville
Towner Justin D., Exchange Building, Memphis

Alternates
Sharp, J. Guilford, Medical Arts Building, Knoxville
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Seeman, George F., Doctors Building, Nashville
Bigger, J. Frank, Medical Arts Building, Memphis

TEXAS

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Hinds, Fred W., Medical Arts Building, Dallas
Robertson, G. P., Nix Professional Building, San Antonio
Talbot, W. O., Trinity Life Building, Fort Worth
Ogle, Willard, Medical Arts Building, Dallas
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Alternates
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Delegate
Spear, Harold E., Swanton

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Hodgkin, W. N., Warrenton
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Alternates
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Bear, Harry, Professional Building, Richmond
Ballou, N. Talley, State Board of Health, Richmond

WASHINGTON

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Barlow, T. B., Bellingham Nat'l Bank Building, Bellingham
Zech, L. W., Medical and Dental Building, Seattle

Alternates
Hagen, W. H., Medical and Dental Building, Seattle
Stansbery, C. J., Medical and Dental Building, Seattle
Schimke, T. D., Old National Bank Building, Spokane
Hampson, R. E., General Insurance Building, Seattle

WEST VIRGINIA

Delegates
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Summers, Howard E., First National Bank Building, Huntington
Cleek, L. D., Bartley

Alternates
Poindexter, J. Bernard, Professional Building, Huntington
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Nicholson, M. H., Bluefield

WISCONSIN

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Hardgrove, T. A., Fond du Lac
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Moen, O. H., Watertown
Hansen, M. C., Arcade Building, Racine
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Bennett, Glenn, Wisconsin Rapids
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Newbury, W. J., Burlington
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WYOMING

Delegate
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Alternate
Stapleton, R. J., Green River

ARMY

Delegate
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Alternate
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NAVY

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Alternate
Crawford, M. J., U. S. Naval Air Station, Corpus Christi, Texas

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Delegate
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Alternate
Harper, Frederick W., U. S. Public Health Service Hospital, Fort Worth, Texas

VETERANS ADMINISTRATION

Delegate
Beers, Lloyd Y., Veterans Administration, Washington, D. C.

Alternate
Lomax, Clifford C., Veterans Administration, Dallas, Texas

PAN AMERICAN DAY AT HOUSTON

TUESDAY, October 28, has been designated as Pan American Day by the President of the American Dental Association in honor of those who attend the Association Meeting from Pan American countries. A luncheon is to be given in the Pan American Room at the Rice Hotel on that day.

DANIEL F. LYNCH, *Chairman,*
Pan American Day Committee
1678 Primrose Road, N. W.
Washington, D. C.

FOOTBALL IN TEXAS

SATURDAY, October 25, 1941: Rice vs. Texas at Austin. Tickets $2.50 plus 15 cents insurance and postage. Remittance to be mailed to Football Ticket Manager, Box G, University of Texas, Austin, Texas.

Saturday, November 1, 1941: Rice vs. Centenary at Houston. Evening game. Tickets $2.20 plus 15 cents insurance and postage. Remittance to be mailed to Rice Athletic Manager, Rice Institute, Houston, Texas.

NEWS ITEMS

ARMY DENTAL CORPS DENTIST TRAINEE RECEIVES COMMISSION AS LIEUTENANT

PRIVATE Milton Philip Paperth, a dentist inducted under the Selective Service and Training Act, has been notified that he will be called to active duty as a first lieutenant in the Dental Corps, the War Department announced today. He will be the first dentist to rise from the ranks under a new regulation permitting

qualified trainees to accept commissions in the Dental Corps Reserve and be ordered to active duty.

Dr. Paperth, whose home address is 111 Main Street, Manasquan, N. J., is now on duty in the Dental Clinic, Station Hospital, Fort Dix, N. J. Other trainee-dentists will receive commissions as fast as they qualify and can be assigned to the Dental Corps.

About 150 dentists have been inducted and nearly all of them have made application for commissions. Each applicant will be passed on by an Army Medical Examining Board and, if approved, will be appointed a first lieutenant in the Dental Corps Reserve.

After the trainee-dentist has accepted the commission, he will be discharged from his enlisted status and ordered to extended active duty for a year. The new officer will be chargeable to the quota allotted his Corps Area. If no vacancy exists to which the officer could be charged, he will be ordered to extended active duty as an excess officer.

The new regulations make it possible for every inducted dentist, provided he is judged qualified, to be commissioned and go on active duty as an officer in the Dental Corps Reserve. It was explained that no commission will be given a dentist until after he is inducted. Action on his application for commission will be taken only after induction. This procedure should not take more than thirty days.

Before the present emergency, there were only 268 officers in the Dental Corps. The Dental Corps Reserve had about 4,000 dentists on its rolls. Of these, about 2,000 have been called to active duty. Because the new regulation is designed to provide commissions for all qualified inducted dentists, for the present no more civilian dentists will be taken into the Dental Corps Reserve.

DENTAL UNITS BEING SENT TO EUROPEAN WAR AREAS

A COMPLETE dental unit, the first of its kind to be sent overseas, has been shipped to the Free French Forces in Northern Africa by the Medical and Surgical Relief Committee of America, 420 Lexington Ave., New York City, according to an announcement made by Mrs. Rogers Balcom, executive chairman. Similar units are now being assembled to meet requests for dental equipment from the American Friends Service of China and the Royal Norwegian Overseas Forces in Iceland.

Each unit consists of a dental chair, an x-ray machine with films, a completely equipped cabinet and dental laboratory materials.

The supplies are being contributed by the members of the International College of Dentists, working under the direction of Elmer S. Best, registrar, of Minneapolis, Minn.

CURRENT LITERATURE

Effect of Local Application of Sulfanilamide upon Wound Healing

By M. Taffel and S. C. Harvey

Edematous wheals were produced in the stomach walls of fifty-seven white rats by the injection of 0.2 cc. of a 3 per cent suspension of sulfanilamide in a physiologic solution of sodium chloride in each. Diametric incisions were made through the wheals and sutured with catgut, which loses its tensile strength in four days. Animals were killed on the fourth, sixth, eighth, tenth, twelfth and fourteenth days postoperatively and the strength of the healed area determined by distention of the stomach with air to the bursting point. No differences were found between the healing of these incisions and that of those made through wheals from injection of physiologic solution of sodium chloride into the stomach walls of fifty-four control rats.—*Proc. Soc. Exper. Biol. & Med.*, 47:202, June 1941.

H. B. McCauley.

Analysis of Dental Amalgams Containing Mercury, Silver, Gold, Tin, Copper and Zinc

By Harold J. Caul and Irl C. Schoonover

The procedure provides for the separation and determination of gold, silver, mercury, tin, copper and zinc in dental amalgams. The chief feature of the procedure is the simultaneous titration of silver and mercury with thiocyanate. It is this feature which makes the method particularly applicable for the analysis of smaller samples; for example, sections of fillings removed from teeth.

Briefly, the method is as follows: The alloy is decomposed with nitric acid, and tin is removed from this solution as metastannic acid. If gold is present, it will accompany the tin precipitate, and it is separated by converting the tin to soluble stannic sulfate. Silver and mercury are collectively titrated with thiocyanate, after which the thiocyanate precipitates are destroyed with nitric and sulfuric acids. The silver is precipitated as the chloride from this solution. The mercury is determined from the thiocyanate titration and the silver determination. Copper, and subsequently zinc, are precipitated as sulfides at the proper acidities.

Simplification of the procedure is presented for use when the composition of the silver alloy is known or when a partial analysis for silver and mercury alone is desired, as is often the case in control work.—*J. Res. Nat. Bur. Stan.*, 26:481, June 1941 (National Bureau of Standards Research Paper 1391).

Daniel F. Lynch.

Oral Lesions Associated with Dietary Deficiencies in Monkeys

By O. D. Chapman and A. E. Harris

Seventy macacus mulatta monkeys were used in a study to determine the effects of vitamin-deficient diets on the production of oral lesions. Monkeys maintained on certain vitam-deficient diets showed a tendency to develop oral lesions with an increase in the fusospirochetal flora. Monkeys on an adequate stock diet did not show these tendencies. These observations indicate that diets deficient in the vitamin B_1 complex, excepting B_6, plus supplements of vitamins A, D and C, nicotinic acid and riboflavin, tend to produce severe oral lesions. Animals maintained on an adequate stock diet resisted attempts at artificial implantation of the fusospirochetal flora.—*J. Infect. Dis.*, 68: 7, July 1941.

A. Pearson.

Some Aspects of Trigeminal Pain

By Gilbert Phillips

The innervation of the structures of the upper and lower jaw is discussed as to its relation to the production of pain about the face. Clinical types of facial pain may be conducted by nerves other than the trigeminal nerve, such as are found in sympathetic neuralgia, migraine and geniculate and glossopharyngeal neuralgia. Pain about

the face on one side may be classified as: dental neuralgia, facial psychalgia, trigeminal neuralgia and reflex neuralgia (sinus involvement).

The treatment advised for trigeminal neuralgia includes alcohol injections, which give relief for a period of from two to three years; sensory ganglion radectomy, and trigeminal tractotomy with resection of the protopathic root in the pons.—*D. J. Australia*, 13:247, June 1941.

A. PEARSON.

One Stage Operation for Closure of Large Defects of Lower Lip and Chin

By H. MAY

A ONE-STAGE operation originally devised by Dieffenbach for closure of large lower lip and chin defects is presented with a modification by the author. The operation is based upon the creation of a triangular defect, which is closed by shifting one or two square composite flaps from the immediate neighborhood into the defect around one point of rotation. A short period of hospitalization, excision of the tumor and closure of the defect in one operation and replacement of lost structures by identical structures, thus restoring original function and appearance, are the advantages cited.—*Surg., Gynec. & Obst.*, 73:236-239, August 1941.

J. EDWARD GILDA.

Changes in Incisor Teeth of Albino Rats with Vitamin A Deficiency and Effects of Replacement Therapy

By ISAAC SCHOUR, M. M. HOFFMAN and M. C. SMITH

THE effects of vitamin-A deficiency on the development of the incisor and the molar teeth of 199 white rats were studied roentgenologically and histologically. Eighty-four of these animals were subjected to various types of replacement therapy. Ninety-five animals were subjected to vital staining with alizarin red S in order to study the rates of dentin apposition. Characteristic roentgenologic changes were found. Histologic findings in the main confirm the classic work of Wolbach and Howe. The primary effect of vitamin-A deficiency is upon the histodifferentiation of the odontogenic epithelium. This is so disturbed that its normal organizing influence upon the pulpal cells, causing differentiation into odontoblasts, is ineffective. With the lack of histodifferentiation, there is a continuation of the proliferative activity of the odontogenic epithelium. The outline of the tooth is distorted and the rate of dentin apposition is selectively altered. Epithelium of the epithelial cords which invade the pulp has an aberrant organizing influence upon the adjacent mesenchyme, resulting in amorphous dentin formation. Replacement therapy results in resumption of the normal rate of dentin apposition and prompt differentiation of the peripheral pulpal cells into odontoblasts.—*Am. J. Path.*, 17:529-561, July 1941.

J. EDWARD GILDA.

First Aid and Emergency Treatment of Gunshot Wounds of Jaws

By R. H. IVY

THE most efficient treatment of face and jaw wounds entails close cooperation between officers of the medical and the dental corps. The general care of the patient, wound infection and tissue repair will largely be problems for the medical officer, while special problems of fixation of fractured jaws and care of the mouth and teeth will be the responsibility of the dental officer.

Points demanding special attention in the combat area are: (1) arrest of hemorrhage; (2) provision of an adequate respiratory airway; (3) temporary approximate reduction and fixation of bone fragments, and (4) provision of safe, preferably rapid, transportation from the combat zone to a hospital in the rear. Here, acute infections are treated and permanent reduction and fixation of bone fragments accomplished. Later, repair, lost tissue replacement and prosthetic replacement can be dealt with.—*Mil. Surgeon*, 89:197-201, August 1941.

J. EDWARD GILDA.

Dietary Repair of Experimental Caries

By REIDAR F. SOGNNAES

EXPERIMENTAL dental caries was produced in the rat by feeding a coarse-corn diet for 100 days. One group of rats were then placed on a stock diet (Fox chow) for sixty days. It was found, at the end of this period, that the exposed dentin was hard and polished. Histologically, the dentin had a sclerotic appearance, and beneath every

point where the surface of the tooth had been involved by caries, a thick layer of secondary dentin had been laid down which safely protected the pulp of the tooth.—*Science*, 93:617, June 27, 1941.

JAMES T. GINN.

Experimentelle Undersogelser over Fosforstofskifte i Menneskelige Taender med Anvendelse of Radioaktivt Fosfor some Indikator (Experimental Investigations of the Phosphorus Metabolism Using Radioactive Phosphorus as Indicator)

By P. O. PEDERSEN and BODIL SCHMIDT-NIELSEN

THE authors first mention the use of radioactive isotopes in biologic research and outline the pioneer work of Hevesy and his co-workers. Secondly, a review is given of previous work with radioactive phosphorus as concerns dental tissues in man and animals. The purpose of the authors' own investigation was to show to what degree the surface enamel takes up phosphorus through the pulp and dentin. Two girls, 10 and 14 years of age, were given radioactive phosphorus orally, and, at different time intervals, four intact bicuspids and three incisors were extracted. Six of these teeth had previously been capped to isolate them from saliva. Samples of surface enamel and middle enamel were ground off under a microscope. The results show that there is no appreciable amount of phosphorus transformed from the pulp to the middle layer and surface layer of the enamel. It is possible that there is an exchange of phosphate ions with saliva on the enamel surface. — *Tandlaegebladet* 45:396, April 1941.

FINN BRUDEVOLD.

Cariesforekomaten hos 471 Bornehavenborn (Occurrence of Caries among 471 Kindergarten Children)

By VIGGO R. JENSEN

FOUR hundred and seventy-one kindergarten children 2 to 6 years of age, from nine different kindergartens in Copenhagen, were examined as to caries and previous dental treatment. At the age of 2, from 7 to 10 per cent of the children had caries in one or more teeth. At the age of 3, this percentage had increased to more than 20 per cent. At 4, it was around 40 per cent, and at the age of 6, it had passed 80 per cent. Girls had, altogether, a higher caries incidence than boys had. Only 15.5 per cent of the children had received dental treatment. This investigation demonstrates the need and importance of dental care at preschool age.—*Tandlaegebladet*, 45:547, June 1941.

FINN BRUDEVOLD.

Verhärtete Karies. Untersuchungen an spanischen Schulkindern aus dem ehemaligen rot-spanischen Gebiete (Arrested Caries. Examination of Spanish School Children in Former Loyalist Territory)

By ERNST ADLER

NUTRITIONAL conditions in Spain were changed radically during the Spanish war. In this investigation, the oral condition of children from a country community, Gerona, was studied. For about three years, these children lived a primitive life, on a diet consisting mainly of vegetables, fruit, ground corn, hazel nuts and, occasionally, fish and bread. Fat was almost entirely lacking. The children showed a very low incidence of caries (55 per cent free from caries) and a very high percentage of the caries present was arrested. Boys from 9 to 14 years of age showed the most favorable conditions: caries in deciduous teeth, 3.7 per cent (all of the teeth); arrested caries, 25 per cent and caries in permanent teeth, 1.2 per cent; with arrested caries, 75 per cent. The author believes that the arrest of caries is due to the mainly vegetarian diet, with a lack of easily fermentable carbohydrates.—*Deutsche Zahnärztl. Wchnschr*, 44:285, May 9, 1941.

FINN BRUDEVOLD.

Developmental Pattern of the Child as Reflected in the Calcification Pattern of the Teeth

By M. MASSLER, ISAAC SCHOUR and H. G. PONCHER

CALCIFIED dental tissues are deposited in incremental strata, which, by their number, indicate the quality of calcification during any given growth period. Hence, their calcification patterns permanently record the sequence of metabolic variations occurring

in the organism. Growth patterns of 1,000 permanent and deciduous teeth from normal healthy children were determined from a study of ground and decalcified sections. The incidence of enamel hypoplastic defects was found clinically.

The poorest calcification and greatest susceptibility to hypoplasia occur between birth and 10 months of age. At about this age, a crisis occurs, and calcification proceeds, abruptly and normally. Acute susceptibility to defective calcification and formation is evidenced by the production of "rings," associated with certain periods: the first two weeks after birth, the age of 10 months, 2¼ years and 5 years. Since the metabolic disturbances indicated by the developmental patterns of teeth are only superficially understood, it is hoped that future clinical observations will be offered for correlation.—*Am. J. Dis. Child.*, 62:33, July 1941.

H. B. McCAULEY.

Domestic Water and Dental Caries. 1. A Dental Caries Study, Including L. Acidophilus Estimations of a Population Severely Affected by Mottled Enamel and Which for the Past Twelve Years Has Used a Fluoride-Free Water

By H. TRENDLEY DEAN; PHILIP JAY; FRANCIS A. ARNOLD, JR., and ELIAS ELVOVE

THIS is a recent study made at Bauxite, Ark., a community in which there is mottling of the enamel, owing to the high fluorine content of the drinking water. In 1928, the water supply system was changed to a fluoride-free one. It was found that, in Bauxite, children with moderate to severe mottling of the enamel and who were exposed to the fluoride-free waters showed markedly less dental caries than a comparable group of Benton children with no mottling of the enamel and who had always used fluoride-free waters. This limited immunity from dental caries is apparently not dependent on the presence of macroscopic mottled enamel, because children born since 1928 and free of mottled enamel showed a low dental-caries experience. However, the lowest age group at Bauxite showed the highest incidence of dental caries in spite of the fact that they had been exposed to caries for the shortest period of time. The *L. acidophilus* counts correspond to the caries activity in the various groups.—*Pub. Health Rep.*, 56:365-381, February 28, 1941.

Studies on Masticatory Efficiency. II. Masticatory Efficiency of Rats

By REIDAR F. SOGNNAES

RATS kept without food overnight were fed in the morning a caries-producing test meal consisting of corn particles about 1 mm. in diameter (between 10 and 20 mesh). Being hungry, the animals filled their stomachs in less than an hour, at which time they were killed and the contents of the stomach dried and examined. The percentage of particles having a mesh size greater than 20 was used to indicate masticatory efficiency. It was found that (1) the masticatory efficiency of rats fed coarse corn for 100 days or more rapidly decreases as molar caries appears; (2) removal of the molars prevents partitioning of 20-mesh particles; (3) younger rats tend to have a greater masticatory efficiency than older ones; (4) rachitic rats have a lowered efficiency, and (5) no appreciable differences exist between the masticatory efficiency of normal rats and of rats showing fluorosis.—*Am. J. Orthodontics*, 27:383, July 1941.

H. B. McCAULEY.

Cancer of the Lip

By HAYES MARTIN; WILLIAM S. MACCOMB, and JOHN V. BLADY

THIS report is based upon a complete analysis of 375 consecutive cases of cancer of the lip, all cases proven by histologic methods, admitted to Memorial Hospital from 1928 to 1934. It includes all patients with cancer of the lip who applied during that period, without excluding any cases because of the advanced stage of the disease.

The authors analyze the etiology, pathology, symptoms, treatment and prognosis of this series of cases. It was found that cancer of the lip comprises about 30 per cent of all tumors of the oral cavity proper. The majority (67 per cent) of these cases occurred between the ages of 50 and 69 years in white males (98 per cent) and occurred more frequently on the lower lip (93 per cent). Many types of irritation seem to play an important part in producing cancer

of the lip. It was found that most of these neoplasms were variations of squamous carcinoma of grades I and II (75 per cent). The diagnosis is not very difficult, for the lip is not particularly susceptible to any disease likely to be mistaken for cancer. Biopsies should be made as an aid to diagnosis and as essential to the record.

Treatment of cancer of the lip presents two separate problems: (1) the care of the primary lesion, and (2) cervical metastasis. In all cases, the methods now in use consist of either irradiation or surgical measures or a combination of the two, depending on the clinical course of the case in question. It was found that complications are infrequent, the most persistent being irradiation necrosis at the site of the primary lesion. Cancer of the lip is the least malignant form of intra-oral cancer. In these cases in which metastases were absent, the percentage of cure rate was 95. However, it was found that the net five-year percentage of cure in this series of 375 cases was 70.—*Ann. Surg.*, 114:226-242, August; 341-365, September 1941.

JAMES T. GINN.

Pattern of Apposition Growth in the Incisor of the Rat

By FRED HERZBERG and ISAAC SCHOUR

THE rat incisor has the form of a recurved cone the apical angle of which is 4° and the spiral angle 86°. Its form is that of a typical logarithmic spiral. Gradients in the rate of dentin apposition were demonstrated by injections of alizarin red S and the life span of the formative cells was estimated. It was found that the rat incisors conform in all respects to the laws of growth applicable to similar organs.—*Anat. Rec.*, 80: 497-506, August 1941.

JAMES T. GINN.

More Frequent Benign Connective Tissue Tumors of the Mouth

By H. H. STONES

THERE are certain benign tumors of the mouth that bear a close clinical resemblance to one another, and it is possible to make a definite diagnosis only after a biopsy and histologic examination. There are typical tumors which are found in the mouth, such as the fibroma, hemangioma, osteoclastoma and fibrous epulis. The author presents the histopathology, clinical features and treatment of these tumors. In addition to the typical tumors mentioned, there are some atypical types which are recognized by histologic examination. In these tumors, there are certain characteristics which indicate that the fibroma differentiates into a hemangioma, and another well-marked series of cases showing differentiation from a fibroma to an osteoclastoma and from a fibroma to a fibrous epulis.

It is believed that the fibroma is composed of vegetative cells, the fibroblasts, and that differentiation may then progress in any one of several directions, forming the other types of tumors.—*Brit. D. J.*, 71:49-61, July 15, 1941.

JAMES T. GINN.

Report of a Number of Cases of Salivary Calculus (Sialolithiasis)

By M. J. BOYER

OF twenty-two cases of sialolithiasis seen in the last five years, four occurred in the parotid gland or duct; the remainder in the submaxillary gland or duct. It is concluded that this condition is not so rare as is commonly supposed. The process, especially the submaxillary, is usually chronic or subacute and may persist for years without being recognized. In addition, it does not generally recur. The importance of differential diagnosis among lymphadenitis, branchial cyst, sublingual abscess and salivary calculus is stressed. Submaxillary salivary calculus should be operated on intra-orally, and the gland should never be removed except when the condition becomes acute.—*Am. J. Orthodontics*, 27:435-447, August 1941.

J. EDWARD GILDA.

A Study of the Relationship of Oral Lactobacillus Acidophilus and Saliva Chemistry to Dental Caries

By FRANCIS A. ARNOLD, JR., and F. J. MCCLURE

THIS is a study of a dental caries experience rate and the increase in that rate over a period of one year in 127 white school children, ranging from 11 to 15 years of age and living in Arlington, Va. This group of children was classified according to the dental caries activity during the year. Bacteriologic studies were made of the saliva of individuals belonging to the various clinical

types. It was found that a close correlation existed between dental caries activity, measured by repeated clinical examination, and the number of *Lactobacillus acidophilus* organisms in the saliva.

The method of formol titration for ammonia nitrogen in urine was applied to the determination of ammonia in saliva, and is reported as a satisfactory rapid clinical method for saliva analysis. The pH of the iso-electric zone of saliva protein was found to vary among different specimens of saliva, but this variation was not correlated with caries activity or with the numbers of *Lactobacillus acidophilus* organisms in the saliva. —*Pub. Health Rep.*, **56**:1495-1514, July 25, 1941.

JAMES T. GINN.

Nasopalatine Block Injection as Aid in Operative Procedures for Maxillary Incisors

By W. H. PHILLIPS and H. A. MAXMEN

LABIAL injections about the maxillary anterior teeth for purposes of operative procedures are in most instances not effective because branches of the nasopalatine nerves, which supplement the anterior superior alveolar innervation of the incisors, are not anesthetized. Embryologic and anatomic evidence support the foregoing concept of innervation. Furthermore, clinical support is provided since more than 2,000 vital pulps have been removed painlessly from the maxillary incisor teeth of children, only the nasopalatine block injection being used. An easy, painless technic for injection high into the incisive canals is described in detail.—*Am. J. Orthodontics*, **27**:426-434, August 1941.

J. EDWARD GILDA.

Mouth as Site of Focal Infection

By F. C. WILKINSON

ACCORDING to the present-day concept, focal infection is a condition in which a localized lesion of chronic infection, usually of long standing, gives rise to a secondary lesion in some distant part of the body or to a general toxemia. Chronic infection about the teeth either periodontal or periapical is of widespread incidence. Yet only a small percentage of those affected suffer from disabilities that would be classed under focal infection. Toxins and bacteria are liable to leak from such sites into circulation, but usually defensive mechanisms of the body are able to deal adequately with them. Occasionally, however, because the leak becomes greater, the organisms more virulent or the natural resistance of the body is interfered with by some other condition, the local lesion may be the most important factor in a general constitutional breakdown or in the production of secondary pathologic lesions. The eradication of areas of chronic infection about the mouth by suitable treatment before any damage is done is the most desirable procedure.—*D. Rec.*, **61**:237-243, August 1941.

J. EDWARD GILDA.

Action of Drugs in the Mouth

By FRANK COLEMAN

THE action of drugs in the mouth fundamentally parallels the action in other parts of the body. Drugs act chiefly on nerves, muscles, cell structures and bacteria.

The drugs used in the mouth affect mainly the arterioles, nerves of general and special sensation, protoplasm of the tissues and surface epithelium. In general, all the procedures in the mouth involving control of hemorrhage, hastening of healing processes, anesthesia, antisepsis and use of caustics depend on the action of the drugs on the types of tissue mentioned.—*D. J. Australia*, **13**: 324, July 1941.

A. PEARSON.

Acute Ulcerative Stomatitis

By C. H. A. WALTON, H. M. GRAHAM and L. P. LANSDOWN

THREE unusual cases of ulcerative stomatitis are reported in which the bacteriologic examination repeatedly revealed only encapsulated gram-positive diplococci which culturally, serologically and biologically lacked the properties of the pneumococcus.

The condition locally was associated with severe systemic reactions. Sulfapyridine therapy was ineffective, but pooled whole blood seemed to react as a specific. There is the possibility that a vitamin B deficiency existed, perhaps accounting for rapid recovery after the administration of whole blood. —*Lancet*, **2**:214, August 1941.

A. PEARSON.

ANNOUNCEMENTS

Announcements must be received by the fifth day of the month in order to be published in the forthcoming issue of The Journal.

CALENDAR OF MEETINGS

American Academy for Plastics Research in Dentistry, Houston, Texas, October 26.

American Academy of Periodontology, Houston, Texas, October 23-25.

American Academy of Restorative Dentistry, Houston, Texas, October 25-26.

American Association for the Advancement of Oral Diagnosis, New York, N. Y., November 13-14.

American Association of Dental Editors, Houston, Texas, October 25.

American Association of Public Health Dentists, Houston, Texas, October 26-28.

American College of Dentists, Houston, Texas, October 26.

American Dental Assistants Association, Houston, Texas, October 27-31.

American Dental Association, Houston, Texas, October 27-31.

American Dental Hygienists' Association, Houston, Texas, October 27-31.

American Public Health Association, Atlantic City, N. J., October 14-17.

American Society for the Advancement of General Anesthesia in Dentistry, New York, N. Y., October 27.

American Society of Dentistry for Children, Houston, Texas, October 26-28.

American Society of Oral Surgeons and Exodontists, Houston, Texas, October 23-25.

Association of American Women Dentists, Houston, Texas, October 27.

Association of Military Surgeons of the United States, Dental Section, Houston, Texas, October 28.

University of Buffalo School of Dentistry Alumni Association, Buffalo, N. Y., October 14-16.

Chicago Dental Society Midwinter Meeting, February 23-26.

Delta Sigma Delta, Houston, Texas, October 27.

District of Columbia Dental Society, second and fourth Tuesdays in each month from October to June at the United States Public Health Service Auditorium, Washington.

Great Lakes Society of Orthodontists, Ann Arbor, Mich., November 3-4.

International College of Dentists, Houston, Texas, October 26.

Metropolitan Dental Societies Officers' Conference, Houston, Texas, October 29.

Midcontinent Dental Congress, St. Louis, Mo., November 17-19.

National Association of Dental Examiners, Houston, Texas, October 25-26.

National Board of Dental Examiners, December 1-2.

University of Nebraska Dental Alumni Association, Lincoln, November 14-15.

Greater New York Dental Meeting, December 1-5, New York.

Odontological Society of Western Pennsylvania, Pittsburgh, November 11-13.

Greater Philadelphia Annual Meeting, February 3-6.

Psi Omega, Houston, Texas, October 27.

STATE SOCIETIES

November

Ohio, at Columbus, (10-12)

December

Florida, at Hollywood (8-10)

STATE BOARDS OF DENTAL EXAMINERS

California, at San Francisco, December 15. Kenneth I. Nesbitt, 515 Van Ness Ave., San Francisco, Secretary.

Connecticut, at Hartford, November 25-29. Clarence C. Brooks, New London, Recorder.

Indiana, at Indianapolis, October 6-10. D. Gordon Lamb, 819 Chamber of Commerce Bldg., Indianapolis, Secretary.

Iowa, at Iowa City, December 15-19. Harry G. Bolks, Sioux City, Secretary.

Minnesota, at Minneapolis, December 15-20. Elmer J. Sundby, 805 Medical Arts Bldg., Duluth, Secretary.

New Jersey, December 8-13. Walter A. Wilson, 150 E. State St., Trenton, Secretary.

Ohio, at Columbus, October 20. Earl D. Lowry, 79 E. State St., Columbus, Secretary.

Pennsylvania, at Philadelphia and Pittsburgh, December 9-13. Reuben E. V. Miller, 61 N. 3rd St., Easton, Secretary.

Texas, at Houston, December 8-11. B. Carl Holder, 1009 Nixon Bldg., Corpus Christi, Secretary.

Wisconsin, at Milwaukee, December 15-19. S. F. Donovan, Tomah, Secretary.

AMERICAN ACADEMY FOR PLASTICS RESEARCH IN DENTISTRY

THE annual meeting of the American Academy for Plastics Research in Dentistry will be held October 26 at 2 p.m. in the Assembly Room of the Houston Chamber of Commerce. Application for admission to the meeting may be made through the secretary's office.

LAMAR W. HARRIS, *Secretary,*
25 East Washington St.,
Chicago, Ill.

AMERICAN ACADEMY OF PERIODONTOLOGY

THE American Academy of Periodontology will hold its twenty-eighth annual meeting at the Lamar Hotel, Houston, Texas, October 23-25.

RAYMOND E. JOHNSON, *Secretary,*
824 Lowry Medical Arts Bldg.,
St. Paul, Minn.

AMERICAN ACADEMY OF RESTORATIVE DENTISTRY

THE American Academy of Restorative Dentistry will meet at the Rice Hotel, Houston, Texas, October 25-26.

W. S. TUCKER, *Secretary,*
940 Canal Bldg.,
New Orleans, La.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF ORAL DIAGNOSIS

THE eighth annual congress of the American Association for the Advancement of Oral Diagnosis will be held in New York, N. Y., November 13-14, at the New York Academy of Medicine. The papers, discussions and exhibits will cover oral diagnosis with special attention to the basic sciences. Members of the medical and the dental professions in the United States and countries of the Western Hemisphere are invited to attend and can obtain programs by communicating with the secretary.

H. JUSTIN ROSS, *Secretary,*
515 Madison Ave.,
New York, N. Y.

AMERICAN ASSOCIATION OF DENTAL EDITORS

THE American Association of Dental Editors will hold its annual meeting in the Rice Hotel, Houston, Texas, October 25. An all day program has been arranged and editors are urged to attend.

O. W. BRANDHORST, *Secretary,*
4952 Maryland Ave.,
St. Louis, Mo.

AMERICAN ASSOCIATION OF PUBLIC HEALTH DENTISTS

THE annual meeting of the American Association of Public Health Dentists will be held in the Lamar Hotel, Houston, Texas, October 26-28.

FRANK C. CADY,, *Secretary,*
U. S. P. H. S. Hospital,
Lexington, Ky.

AMERICAN COLLEGE OF DENTISTS

THE Houston convocation of the American College of Dentists will be held in the Rice Hotel, October 26, with morning, luncheon, afternoon and evening sessions.

O. W. BRANDHORST, *Secretary,*
4952 Maryland Ave.,
St. Louis, Mo.

AMERICAN DENTAL ASSISTANTS ASSOCIATION

THE seventeenth annual session of the American Dental Assistants Association will be held in Houston, Texas, October 27-31. For further information, address

AILEEN M. FERGUSON,
General Secretary,
709 Centre St.,
Jamaica Plain, Mass.

AMERICAN DENTAL HYGIENISTS' ASSOCIATION

THE eighteenth annual meeting of the American Dental Hygienists' Association will be held in Houston, Texas, October 27-31. Headquarters, Lamar Hotel.

A. REBEKAH FISK, *Secretary,*
General Dispensary, U. S. Army,
Washington, D. C.

AMERICAN PUBLIC HEALTH ASSOCIATION

THE seventieth annual meeting of the American Public Health Association will be held in Atlantic City, N. J., October 14-17. Headquarters, Convention Hall; residence headquarters, Hotel Traymore. Ira V. Hiscock, professor of public health at the Yale School of Medicine, will speak at the luncheon session of the oral health group. Subject: "How Important Is the Dental Health Program? Nationally? Locally?"

WILLIMINA RAYNE WALSH,
Associate Secretary,
1790 Broadway,
New York, N. Y.

AMERICAN SOCIETY FOR THE ADVANCEMENT OF GENERAL ANESTHESIA IN DENTISTRY

THE fall meeting of the American Society for the Advancement of General Anesthesia in Dentistry will be held October 27 at the Midston House, Thirty-Eighth Street and Madison Avenue, New York, N. Y. Paul M. Wood, M.D., assistant clinical professor of anesthesia, New York Medical College, will speak on "Management of Emergencies in Dental Anesthesia." The scientific session at 8:30 p.m. will be preceded by an informal dinner at 7 o'clock, to which the profession is invited.

M. HILLEL FELDMAN, *Secretary,*
730 Fifth Ave.,
New York, N. Y.

AMERICAN SOCIETY OF DENTISTRY FOR CHILDREN

THE annual meeting of the American Society of Dentistry for Children will be held in the Lamar Hotel, Houston, Texas, October 26-28. For additional information, address

R. M. ERWIN, JR., *Secretary,*
613 Corbett Bldg.,
Portland, Ore.

AMERICAN SOCIETY OF ORAL SURGEONS AND EXODONTISTS

THE twenty-second annual meeting of the American Society of Oral Surgeons and Exodontists will be held in Houston, Texas, October 24-25, with headquarters at the Texas State Hotel.

HARRY BEAR, *Secretary,*
410 Professional Bldg.,
Richmond, Va.

ASSOCIATION OF AMERICAN WOMEN DENTISTS

THE Association of American Women Dentists will hold its annual meeting in the French Room of the Rice Hotel, Houston, Texas, October 27. Breakfast served at 9 o'clock.

MURIEL K. G. ROBINSON, *Secretary,*
4906 Walnut St.,
Philadelphia, Pa.

ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES DENTAL SECTION

THE annual dinner of the Military Surgeons will be held October 28 at 7 p.m. in the Rice Hotel, Houston, Texas. All dental officers on active duty with the Federal Services are invited. For reservations, notify L. W. Maly, chairman, Dinner Committee, Camp Hulen, Texas.

R. C. CRAVEN, *Secretary.*

UNIVERSITY OF BUFFALO SCHOOL OF DENTISTRY ALUMNI ASSOCIATION

THE forty-first annual meeting of the University of Buffalo Dental Alumni Association will be held October 14-16 at Hotel Statler, Buffalo. The Eighth District Dental Society of the State of New York is cooperating in the development of the program. All ethical practitioners are invited.

JOHN D. LYNCH,
Chairman of Publicity.

CHICAGO DENTAL SOCIETY MIDWINTER MEETING

THE 1942 Midwinter Meeting of the Chicago Dental Society will be held at the Palmer House, February 23-26.

GLENN E. CARTWRIGHT, *President.*

DELTA SIGMA DELTA FRATERNITY

THE fifty-seventh annual meeting of the Supreme Chapter of Delta Sigma Delta will be held at the Texas State Hotel for the

morning and afternoon sessions and the annual banquet at the Rice Hotel, October 27. The first session, at 9:30 a.m., will be followed by a complimentary luncheon to the members. At the afternoon session immediately following, a business meeting of the Supreme Chapter will be followed by the initiation of any candidates who may be presented. The annual banquet will be held at 6:30. Women are invited. Members registering for the luncheon and banquet must present membership cards.

R. HAMILL D. SWING, *Supreme Scribe.*

GREAT LAKES SOCIETY OF ORTHODONTISTS

THE Great Lakes Society of Orthodontists will meet November 3-4 at Ann Arbor, Mich.

RICHARD E. BARNES, *Secretary,*
1704 Republic Bldg.,
Cleveland, Ohio.

INTERNATIONAL COLLEGE OF DENTISTS

THE 1941 convocation of the U. S. A. Section of the International College of Dentists will be held at the Rice Hotel, Houston, Texas, October 26 at 6 p.m.

ELMER S. BEST, *Registrar,*
801 Medical Arts Bldg.,
Minneapolis, Minn.

METROPOLITAN DENTAL SOCIETIES OFFICERS' CONFERENCE

THE second annual Metropolitan Dental Societies Officers' Conference will be held at the Rice Hotel, Houston, Texas, October 29.

CHARLES H. JAMIESON, *Chairman,*
8545 Gratiot Ave.,
Detroit, Mich.

MIDCONTINENT DENTAL CONGRESS

THE Midcontinent Dental Congress will be held in St. Louis, Mo., November 17-19.

VAL H. FREDERICH, *Chairman,*
Exhibit Committee,
Arcade Bldg.,
St. Louis, Mo.

NATIONAL ASSOCIATION DENTAL EXAMINERS

THE fifty-ninth annual meeting of the National Association of Dental Examiners will be held in the Sam Houston room of the Rice Hotel, October 25 and 26. At noon, October 25, a luncheon will be held in the French room on the mezzanine floor of the Rice Hotel, with a round table discussion on several important topics in the field of dentistry.

R. P. THOMAS, *Secretary,*
Francis Building,
Louisville, Ky.

NATIONAL BOARD OF DENTAL EXAMINERS

THE National Board of Dental Examiners will hold its next session for the examination of candidates in Parts I and II, December 1-2, in schools where there are five or more candidates. For further information and application blanks, address

MORTON J. LOEB, *Secretary,*
66 Trumbull St.,
New Haven, Conn.

UNIVERSITY OF NEBRASKA DENTAL ALUMNI ASSOCIATION

THE University of Nebraska Dental Alumni Association will hold its annual homecoming meeting November 14-15 at the college, with various lectures, demonstrations and clinics by the faculty and guest speakers. Pittsburgh vs. Nebraska football game Saturday afternoon.

RALPH L. IRELAND, *Secretary,*
College of Dentistry,
Lincoln.

GREATER NEW YORK DENTAL MEETING

THE Greater New York Dental Meeting will be held December 1-5 at the Hotel Pennsylvania, New York.

WALTER A. QUINN, *Chairman,*
Press & Publication,
Room 106A,
Hotel Pennsylvania,
New York.

ODONTOLOGICAL SOCIETY OF WESTERN PENNSYLVANIA

THE annual meeting of the Odontological Society of Western Pennsylvania will be held November 11-13 at the William Penn Hotel, Pittsburgh.

W. EARLE CRAIG, *Secretary,*
206 Jenkins Bldg.,
Pittsburgh.

GREATER PHILADELPHIA ANNUAL MEETING

THE Greater Philadelphia Annual Meet-

ing, which will be a combined meeting of the Pennsylvania State Dental Society and the Philadelphia County Dental Society, will be held February 3-6 at the Benjamin Franklin Hotel.

ABRAM COHEN, *Chairman,*
Publicity Committee,
269 S. 19th St.,
Philadelphia, Pa.

PSI OMEGA

THE annual dinner of the Psi Omega Fraternity, National Alumni Chapter, will be held at 6:30 Monday evening, October 27, at the Lamar Hotel. A Mexican dinner will be served and there will be favors for the women in attendance. Headquarters will be maintained at the Lamar Hotel, throughout the Annual Meeting of the American Dental Association. All members are requested to register at headquarters on arrival. A business meeting will be held at 10 a.m., October 28.

LLOYD H. DODD, *Secretary,*
National Alumni Chapter,
860 Citizens Bldg.,
Decatur, Ill.

FLORIDA STATE DENTAL SOCIETY

THE fifty-eighth meeting of the Florida State Dental Society will be held at the Hollywood Hotel, Hollywood, December 8-10.

WILLIAM P. WOOD, JR., *Secretary,*
442 W. Lafayette St.,
Tampa.

OHIO STATE DENTAL SOCIETY

THE seventy-sixth annual meeting of the Ohio State Dental Society will be held at the Neil House, Columbus, November 10-12. All A.D.A. members are invited.

EDWARD C. MILLS, *Secretary,*
255 E. Broad St.,
Columbus.

BOARD OF DENTAL EXAMINERS OF CALIFORNIA

THE next examination to be conducted by the Board of Dental Examiners of California for a license to practice dentistry in California will be held in San Francisco commencing December 15 at the Physicians and Surgeons College of Dentistry for the theory portion of the examination and at the University of California, College of Dentistry for the practical portion of the examination. All credentials must be in the office of the Secretary at least twenty days prior to the date of the examination. Address all communications to

KENNETH I. NESBITT, *Secretary,*
515 Van Ness Ave.,
San Francisco.

THE CONNECTICUT DENTAL COMMISSION

THE Connecticut Dental Commission will meet in Hartford, November 25-29, for the examination of applicants for license to practice dentistry and dental hygiene and to transact any other business proper to come before it. Applications should be in the hands of the recorder at least ten days before the meeting. For application blanks and further information, apply to

CLARENCE G. BROOKS, *Recorder,*
New London.

INDIANA STATE BOARD OF DENTAL EXAMINERS

THE next examination for licensure of the Indiana State Board of Dental Examiners will be held in Indianapolis beginning October 6 and continuing four days. All applications, fees and credentials must be in the hands of the secretary not later than ten days prior to the beginning date of the examinations. For applications, instructions and other information, address

D. GORDON LAMB, *Secretary,*
819 Chamber of Commerce Bldg.,
Indianapolis.

IOWA STATE BOARD OF EXAMINERS

THE Iowa State Board of Examiners will hold its next examination in Iowa City, December 15-19, for those desiring a license as dentist or as dental hygienist. Address Harry G. Bolks, secretary of the board, Sioux City, for instructions regarding registration for examination, etc.

MINNESOTA STATE BOARD OF DENTAL EXAMINERS

THE Minnesota State Board of Dental Examiners will hold its next examination at the School of Dentistry, University of Minnesota, Minneapolis, December 15-20. For information and application, address

ELMER J. SUNDBY, *Secretary,*
805 Medical Arts Bldg.,
Duluth.

STATE BOARD OF REGISTRATION AND EXAMINATION IN DENTISTRY OF NEW JERSEY

THE State Board of Registration and Examination in Dentistry of New Jersey will hold its annual examinations commencing December 8 and continuing for five days thereafter. On application to the secretary, a copy of the requirements and rules, instruction sheet and preliminary application will be forwarded. Any person desiring to become a candidate must file the preliminary application blank, together with the examination fee of $25 on or before September 1.

WALTER A. WILSON, *Secretary,*
150 E. State St.,
Trenton.

OHIO STATE DENTAL BOARD

THE next examination of the Ohio State Dental Board will be held at Ohio University, College of Dentistry, Columbus, the week beginning October 20. All applications must be in the hands of the secretary at least ten days before the examination. For further information, apply to

EARL D. LOWRY, *Secretary,*
79 E. State St.,
Columbus.

DENTAL COUNCIL AND EXAMINING BOARD OF THE COMMONWEALTH OF PENNSYLVANIA

THE Dental Council and Examining Board of the Commonwealth of Pennsylvania will conduct examinations in Philadelphia and Pittsburgh, December 9-13. For information and application blanks, address the Department of Public Instruction, Bureau of Professional Licensing, Dental Division, Harrisburg.

REUBEN E. V. MILLER, *Secretary,*
61 N. Third St.,
Easton, Pa.

TEXAS BOARD OF EXAMINERS

THE Texas Board of Dental Examiners will hold its next examination December 8-11 in Houston. Applications must be filed at least ten days prior to date of examination. For further information, address

B. CARL HOLDER, *Secretary,*
1009 Nixon Bldg.,
Corpus Christi.

STATE OF WISCONSIN BOARD OF DENTAL EXAMINERS

THE next examination will be held December 15-19 at Marquette University Dental School, Milwaukee. Applications and information may be had by writing to the secretary. Applications and required fee must be at the secretary's office by December 5.

S. F. DONOVAN, *Secretary,*
Tomah.

SOCIETY OF THE NEW YORK HOSPITAL LEWIS CASS LEDYARD, JR., FELLOWSHIP

THE Lewis Cass Ledyard, Jr., Fellowship was established in 1939 by a gift from Mrs. Lewis Cass Ledyard, Jr., in memory of her husband, a governor of the New York Hospital. The income, amounting to approximately $4,000 annually, will be awarded to an investigator in the fields of medicine and surgery, or in any closely related field. The recipient will be required to submit reports of his work under the fellowship, either at stated intervals or at the end of the academic year. The research work is to be carried on at the New York Hospital and Cornell Medical College. The fellowship will be available July 1 at the beginning of the academic year. Applications for the year 1942-1943 should be in the hands of the committee by December 15. It is expected that the award will be made by March 15, 1942. Application for this fellowship should be addressed to the Committee of the Lewis Cass Ledyard, Jr. Fellowship, the Society of the New York Hospital, 525 E. 68th St., New York, N. Y.

DENTAL SUPPLIES FOR GREAT BRITAIN AND CHINA

THE United States Section of the International College of Dentists is sponsoring a movement to aid the dentists of Great Britain and China by providing them with badly needed supplies, instruments and small equipment used in the practice of dentistry. These will be collected and sent abroad by the Medical and Surgical Relief Committee of America. Any member of the dental profession or dental trade who can aid in this movement by contributions of such material is asked to communicate with Mrs. Rodgers Balcom, executive chairman of the Medical

and Surgical Relief Committee of America, 420 Lexington Ave., New York, N. Y.

ELMER S. BEST, *Registrar,*
Medical Arts Bldg.,
Minneapolis, Minn.

BRONX HOSPITAL VOLUNTEERSHIPS

THE Dental Department of the Bronx Hospital offers a number of volunteerships to recent graduates in dentistry in the following branches: oral surgery and anesthesia; surgical pyorrhea; orthodontia; root canal therapy, and operative dentistry. Those offering satisfactory credentials indicating their interest in the clinical study of dental surgery as a health problem will receive consideration. Address applications to the Dental Department, Bronx Hospital, Fulton Ave. at 169th St., Bronx, New York. Appointments will begin in July.

DAVID WURZEL, *Director,*
Dental Department.

CARNEGIE FELLOWSHIPS FOR RESEARCH AND GRADUATE WORK IN THE DENTAL SCIENCES

AIDED by the Carnegie Corporation, the School of Medicine and Dentistry of the University of Rochester offers scholarships paying $1,200-$1,800 per annum to well-trained dental graduates who are interested in research or who desire special training in the basic medical sciences as an aid to dental teaching or practice. A few fellowships also offer part-time training in oral surgery. On appointment, the applicant is given the title of Carnegie Dental Fellow and, according to his interest, works as a graduate student in one of the departments of the medical schools. Here, excellent laboratory facilities, adequate direction and close contact with various investigations related to medicine and dentistry help his research and study. Fellows are encouraged to attend medical classes, seminars and staff meetings and, when opportunity presents itself, to participate in class instruction and scientific meetings. Contact with the problems of clinical dentistry may be maintained through the Oral Surgery Clinic of the Strong Memorial Hospital and the Rochester Dental Dispensary. With the approval of the Graduate Council of the university, Fellows may prepare themselves for the degree of M.S. or Ph.D. Application should be made to

GEORGE H. WHIPPLE, *Dean,*
School of Medicine and Dentistry,
Rochester, N. Y.

POSTGRADUATE COURSE IN PRACTICE MANAGEMENT, SCHOOL OF DENTAL AND ORAL SURGERY, COLUMBIA UNIVERSITY

THE School of Dental and Oral Surgery, Columbia University, offers a course in practice management for qualified graduates in dentistry under the direction of George Wood Clapp, D.D.S., October 7, 9, 14 and 16 and November 6, 13, 18 and 25. Admission to the course is limited to members of the American Dental Association. For further information, address the assistant to the registrar, School of Dental and Oral Surgery, 630 W. 168th St., New York, N. Y.

CHICAGO COLLEGE OF DENTAL SURGERY ALUMNI BREAKFAST

THE Chicago College of Dental Surgery, Dental School of Loyola University, will hold an alumni breakfast during the meeting of the American Dental Association in Houston, Texas, October 29, at 8:00 a.m., in the South American Room of the Rice Hotel.

HENRY GLUPKER, *President,*
Alumni Association,
Chicago College of Dental Surgery,
1757 West Harrison St.,
Chicago, Ill.

NEW YORK UNIVERSITY COLLEGE OF DENTISTRY POSTGRADUATE COURSE IN INHALATION ANESTHESIA

E. A. ROVENSTINE, professor of anesthesia, New York University College of Medicine and Bellevue Hospital, and A. S. Mecca, assistant professor of oral surgery, New York University College of Dentistry and Bellevue Hospital, will give a course in inhalation anesthesia consisting of lectures and practical demonstrations Fridays for six consecutive weeks beginning October 3 and ending November 7. The course will deal with the theory and practice of general anesthesia in ambulatory cases and cases in private practice. Direct all communications to the office of the dean, New York University Dental College, 209 E. Twenty-Third St., New York, N. Y.